RECEIVED
APR 2 3 2015
DIVISION OF WATER QUALITY

Attachment E – Notice of Intent

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

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

I. NOTICE OF INTENT STATUS (see Instructions)

Mark only one item A. x New Applicator B. Change of Information: WDID# _____ C. ☐ Change of ownership or responsibility: WDID# 5 45AP00003

II. DISCHARGER INFORMATION

A. Name Anderson-Cottonwood Irrigation District (ACID)			
B. Mailing Address 2810 Silver Street			
C. City Anderson	D. County Shasta	E. State CA	F. Zip 96007
G. Contact Person Stan Wangberg	H. E-mail address acidstan@sbcglcbal.net	I. Title General Manager	J. Phone 530-365-7329

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: ACID Canal
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 5
(List all regions where algaecide and aquatic herbicide application is proposed.)

V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: ____

Algea, submerged and floating aquatic vegetation

B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients

Acrolein

C. Period of Application: Start Date June 1 End Date October 1

D. Types of Adjuvants Used:

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: Stan Wangberg

B. Signature: _____ **Date:** 4/22/15

C. Title: General Manager

XI. FOR STATE WATER BOARD STAFF USE ONLY

WDID:	**Date NOI Received:**	**Date NOI Processed:**
Case Handler's Initial:	**Fee Amount Received:** **$**	**Check #:**
☐ **Lyris List Notification of Posting of APAP**	**Date** _____	**Confirmation Sent** _____

AQUATIC PESTICIDE APPLICATION PLAN

ANDERSON-COTTONWOOD IRRIGATION DISTRICT
SHASTA AND TEHAMA COUNTIES, CALIFORNIA

Prepared for

Anderson Cottonwood Irrigation District

Prepared by

VESTRA Resources, Inc.
5300 Aviation Drive
Redding, California 96002

APRIL 2015

AQUATIC PESTICIDE APPLICATION PLAN

ANDERSON COTTONWOOD IRRIGATION DISTRICT
SHASTA AND TEHAMA COUNTIES, CALIFORNIA

Prepared for

Anderson-Cottonwood Irrigation District

Prepared by

VESTRA Resources Inc.
5300 Aviation Drive
Redding, CA 96002

71114

APRIL 2015

TABLE OF CONTENTS

SECTION

1.0 INTRODUCTION 1

2.0 WATER SYSTEM DESCRIPTION 3
- 2.1 Site Location 3
- 2.2 Canal Layout 3

3.0 HERBICIDE APPLICATION 4
- 3.1 Treatment Area 4
- 3.2 Vegetation Control Objectives 4
- 3.3 Acrolein Characteristics 4
- 3.4 Application Practices 5
- 3.5 Application BMPs 5

4.0 EXAMINATION OF ALTERNATIVES 7
- 4.1 Mechanical Removal 7
- 4.2 Controlled Burns 7
- 4.3 Grazing 7
- 4.4 Tilling or Disking 7
- 4.5 No Controls 7

5.0 MONITORING PROGRAM 8
- 5.1 Monitoring Locations 9
- 5.2 Sampling Procedures 9
- 5.3 Visual Monitoring 10
- 5.4 Recordkeeping 11

6.0 REPORTING 11

TABLES

1 Weed Conditions and Application Rates 5
2 Monitoring Requirements 8
3 Application Monitoring Times and Locations 9

FIGURES

1 Main Canal

APPENDICES

A Magnacide Application and Safety Manual
B Application Log Sheet

1.0 INTRODUCTION

Aquatic vegetation is a serious waterway pest, especially in irrigation canals. Weeds and algae can reduce flows of canals and clog waterways, potentially resulting in overflow and levee breakage. Decreased flow rates related to weeds can also cause sedimentation and debris accumulation, requiring periodic cleanouts. As weeds break lose, they have the potential to clog weirs, siphons, and other canal structures. To control aquatic weeds and algae, the Anderson-Cottonwood Irrigation District (ACID) uses acrolein herbicide in their canal system.

Vegetation management activities are conducted to maintain flow, conveyance capacity, establish a canopy of riparian trees, and control invasive vegetation. Use of herbicides to control aquatic vegetation is relatively consistent from year to year. Herbicide is directly applied to the main channel to target submerged and floating aquatic vegetation to maintain channel flow conveyance capacity. The District uses acrolein (sold under the trade names Aqualin and Magnacide) for aquatic herbicide applications.

The preparation of an Aquatic Pesticide Application Plan (APAP) is required by federal regulation that is administered in California by the State Water Resources Control Board (SWRCB) through the Regional Water Quality Control Boards (RWQCB). On March 12, 2001, the Ninth Circuit Court of Appeals held that discharges of pollutants from the use of aquatic pesticides in waters of the United States require coverage under an NPDES permit (Headwaters, Inc., v. Talent Irrigation District). In 2001, the SWRCB adopted the *Statewide General NPDES Permit for Discharges of Aquatic Pesticides to Waters of the United States* (Order No. 2001-12-DWQ) on an emergency basis to provide immediate NPDES permit coverage for broad categories of aquatic pesticide use in California. Order No. 2001-12-DWQ expired on January 31, 2004, and was replaced by two general permits: a vector control permit for larvicides (Order No. 2004-0008-DWQ) and a weed control permit (Order No. 2004-0009-DWQ). The SWRCB determined that adoption of these two permits was consistent with the Ninth Circuit decision.

In 2005, the Ninth Circuit held that a pesticide that is applied in a manner consistent with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is not a "chemical waste" (Fairhurst v. Hagener), and stated that it would not change its decision in Headwaters. The court stated that whether an NPDES permit was required depends on whether there was any "residue or unintended effect" from application of the pesticide.

On November 20, 2006, U.S. EPA adopted a final ruling (Final Rule) providing that NPDES permits are not required for pesticide applications as long as the Discharger follows FIFRA label instructions. According to the regulation, pesticides applied under the following two circumstances are not pollutants and, therefore, are not subject to NPDES permitting requirements:

a. The application of pesticides directly to waters of the United States in order to control pests. Examples of such applications include applications to control mosquito larvae, aquatic weeds, or other pests that are present in waters of the United States; and

b. The application of pesticides to control pests that are present over waters of the United States, including near such waters, where a portion of the pesticides will unavoidably be deposited to waters of the United States in order to target the pests effectively; for example, when insecticides are aerially applied to a forest canopy where waters of the United States may be present below the canopy or when pesticides are applied over or near water for control of adult mosquitoes or other pests.

On January 11, 2009, the Sixth Circuit Court of Appeals determined that USEPA's Final Rule is not a reasonable interpretation of the Clean Water Act and vacated the Final Rule. USEPA did not request reconsideration of the decision, but did file a motion for a two-year stay of the effect of the decision in order to provide agencies time to develop, propose, and issue NPDES general permits for pesticide applications covered by the ruling.

In response to the court ruling, the SWRCB issued the *Statewide General Permit for Residual Aquatic Pesticide Discharges to Waters of the United State from Algae and Aquatic Weed Control Applications* (WQ Order No. 2013-0002-DWQ; NPDES General Permit No. CAG990005), which became effective December 1, 2013. This General Permit serves as a general NPDES permit for the discharge of residual algaecides and aquatic herbicides to surface waters as a result of algaecide and aquatic herbicide applications for algae and aquatic weed control.

This APAP has been prepared to comply with the terms of the General Permit and covers the application of aquatic herbicides throughout the ACID canal system.

The General Permit Fact Sheet outlines the following elements that are required to be included in the APAP:

1. Description of the water system to which algaecides and aquatic herbicides are being applied;
2. Description of the treatment area in the water system;
3. Description of types of weed(s) and algae that are being controlled and why;
4. Algaecide and aquatic herbicide products or types of algaecides and aquatic herbicides expected to be used and if known their degradation byproducts, the method in which they are applied, and if applicable, the adjuvants and surfactants used;
5. Discussion of the factors influencing the decision to select algaecide and aquatic herbicide applications for algae and weed control;
6. If applicable, list the gates or control structures to be used to control the extent of receiving waters potentially affected by algaecide and aquatic herbicide application and provide an inspection schedule of those gates or control structures to ensure they are not leaking;
7. If the Discharger has been granted a short-term or seasonal exception under State Water Board Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Policy) section 5.3 from meeting acrolein

and copper receiving water limitations, provide the beginning and ending dates of the exception period, and justification for the needed time for the exception;

8. Description of monitoring program;
9. Description of procedures used to prevent sample contamination from persons, equipment, and vehicles associated with algaecide and aquatic herbicide application;
10. Description of the Best Management Practices (BMPs) to be implemented;
11. Examination of possible alternatives.

Each of these items is discussed in the following sections. Item 6 (use of control structures) is not applicable to this project as the canal system does not discharge to receiving waters. Additionally, Item 7 does not apply for this project as ACID has not been granted a short-term or seasonal exception under *State Water Board Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*.

2.0 WATER SYSTEM DESCRIPTION

2.1 Site Location

ACID is a surface water purveyor with two diversion points on the Sacramento River. ACID diverts water from the Sacramento River in Redding, California, to be used for irrigation of properties in Shasta and Tehama Counties. Water is removed from the Sacramento River via a gravity diversion dam and downstream pump station. Water is transported through a complex series of canals and laterals and supplied to properties in and surrounding the communities of Anderson and Cottonwood. The area served by ACID is shown on Figure 1.

2.2 Canal Layout

The distribution of ACID water occurs via a main canal and a system of laterals. Lengths of canals and laterals were computed using aerial imagery and GIS software. The main canal has an average width of 30 feet and conveys water throughout the irrigation season (April to October). Laterals are more variable in width, with an average width of 10 feet. The main canal footprint is shown on Figure 1. Lateral maps are available upon request.

ACID's service area includes approximately 32,000 acres, with direct service to approximately 7,000 acres and approximately 900 customers. The District extends south from the City of Redding in Shasta County to northern Tehama County, encompassing the city of Anderson and the town of Cottonwood. ACID supplies only agricultural irrigation water and does not provide water for municipal and industrial uses. Approximately 90 percent of ACID's customers irrigate pasture for haying or livestock; however, some orchard and other food crops are also grown.

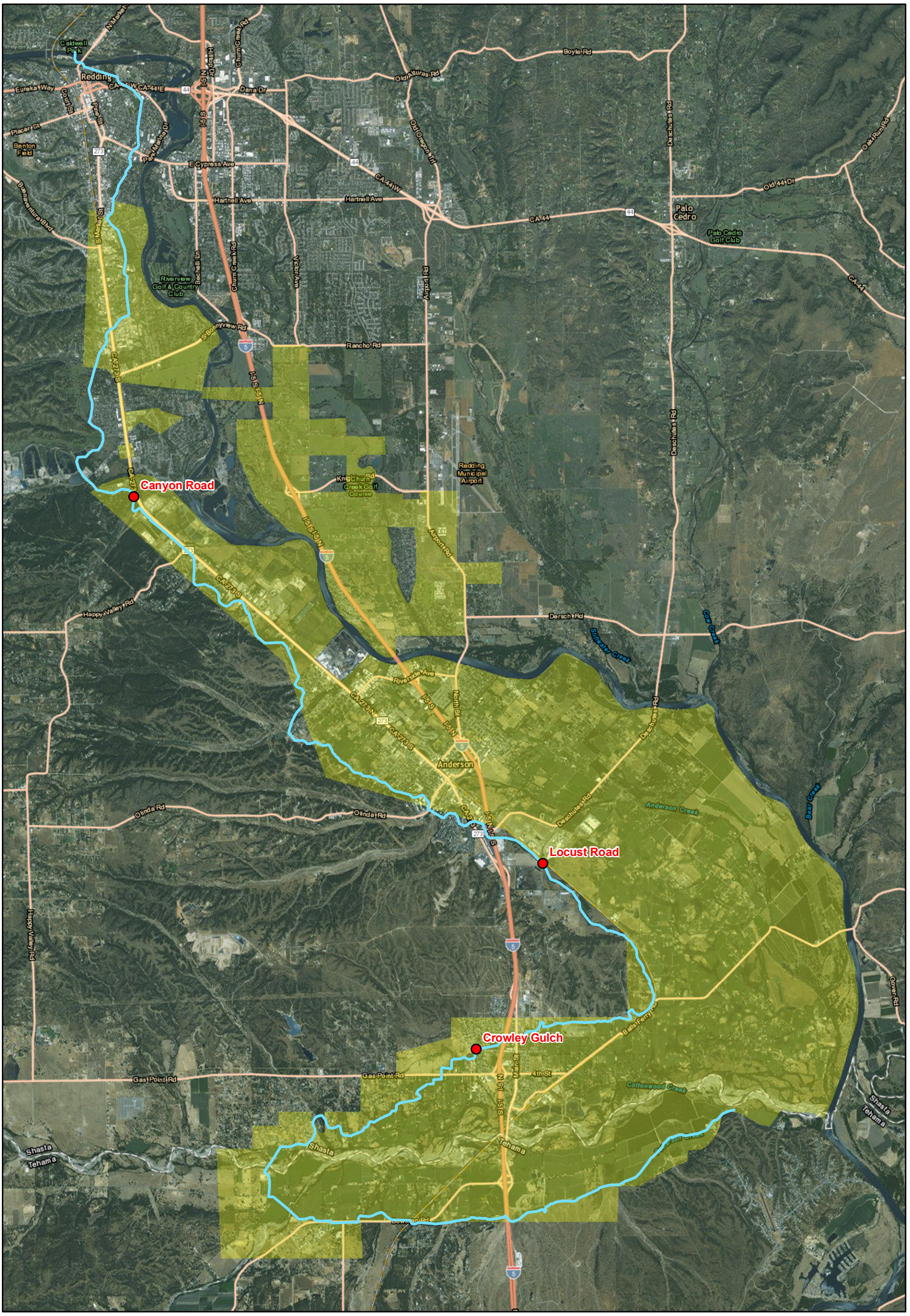


FIGURE 1
MAIN CANAL
ANDERSON COTTONWOOD IRRIGATION DISTRICT
SHASTA COUNTY, CALIFORNIA

P:\GIS\71114\71114_MainCanal.mxd

3.0 HERBICIDE APPLICATION

3.1 Treatment Area

Due to the large scale of the ACID canal and lateral system, aquatic herbicide application is the most efficient means of controlling aquatic vegetation; however, aquatic herbicide application is primarily intended to control aquatic vegetation in the main canal. Herbicide is applied at three locations: the canal intersections with Canyon and Locust Roads and the Crowley Gulch siphon. The three application locations are shown on Figure 1.

3.2 Vegetation Control Objectives

Primary weeds of concern found in the canal include common duck weed (*Lemna minor*), curly leaf pondweed (*Potamogeton crispus*), filamentous algae, and planktonic algae. The presence of these weeds adversely impacts the water conveyance efficiency of the canal system. The objective of vegetation control is to prohibit growth of vegetation to allow irrigation water to flow without impediment and prevent vegetation from clogging the canal system.

3.3 Acrolein Characteristics

Acrolein has been selected as the herbicide to be used by ACID for the removal of aquatic weeds. Submersed aquatic weeds lack the waxy cuticle present in terrestrial vegetation. Because of the lack of a waxy cuticle, acrolein can react with specific proteins in the aquatic weed cell membranes, causing the cells of the plant to rupture. Weeds become discolored and flaccid within a few hours, rapidly increasing canal capacity, and disintegrate over several days. Because acrolein causes plant tissue to disintegrate, there is little concern that dead vegetation will cause clogged canal structures.

Acrolein has broad toxicity to submerged algae and weeds and reacts with organic matter, aquatic plants, and water. Acrolein can travel the long distances of an application canal. Many environmental factors will affect application distances such as organic content in the water, pH, abundance, and species of weeds. Flow rate is a key factor in the distance the herbicide will be transported. Applications in the higher velocity main canal will cover more distance than any lateral applications. According to the manufacturer, in a canal flowing with a velocity greater than 0.5 mile per hour and aquatic weeds 24 inches or less in length, one can expect control for 8 to 12 miles.

Acrolein is very reactive and breaks down quickly in the environment. Fish are known to be sensitive to Magnacide; however, this is not an issue for the ACID canal system which does not contain fish or discharge to fish-bearing streams. In soil, acrolein adsorbs to the soil particles and becomes inactive. Naturally occurring bacteria in the soil continue the breakdown to the final stage of carbon dioxide and water. In plants, what little chemical is absorbed is rapidly metabolized into naturally occurring plant materials. There are no harvest or plant-back restrictions on crops or soil following an application of acrolein.

3.4 Application Practices

Herbicide application typically occurs once per year in late June, although the date may vary with yearly conditions. Acrolein is forced from the product container using nitrogen gas and introduced directly into the canal. Typically, application is performed at the three application sites over a two-day period as follows:

- Day 1: Canyon Road, 6:00 a.m. until noon
- Day 2: Locust Road, 6:00 a.m. until 9:00 a.m.
- Day 2: Crowley Gulch, 10:00 a.m. until 1:00 p.m.

Flow rates in the main canal are reduced to 100 cubic feet per second (cfs) during the application to prevent the chance of overflow beyond the main canal. Concentrations between 1 and 15 parts per million (ppm) are required for vegetation control. Table 1 outlines the concentration of herbicide necessary for varying vegetation conditions.

Table 1
WEED CONDITIONS AND APPLICATION RATES

Weed Condition	Volume of Acrolein to be Added[1]
Little algae and pondweed less than 6 inches long	20 gallons
Algae (non-floating) and pondweed less than 12 inches long	30 gallons
Algae (some floating) and pondweed 12-24 inches long	60 gallons
Algae (some floating) and mature pondweed	120 gallons
Choked conditions	180 gallons

Notes:
[1] = Volume calculated using the EPA application manual. Flow rate of 100 cfs is assumed. Water temperature in the canal is anticipated to be between 60 and 55 degrees in late June when application typically occurs.

All aquatic herbicide application are made according to the manufacturer's label and in accordance with regulations of the USEPA, California Environmental Protection Agency, California Department of Pesticide Regulation, California Division of Occupational Safety and Health, and the local Agricultural Commissioner. Precautions on the product label to prevent fish kill or other impacts to wildlife are followed. USEPA's *Magnacide Application and Safety Manual* is included as Appendix A.

3.5 Application BMPs

3.5.1 Standard Herbicide Use Requirements

Only herbicides and surfactants that have been approved for aquatic use by the USEPA and are registered for use by the California Department of Pesticide Regulation (CDPR) are used for aquatic vegetation control work. Herbicide application is consistent with FIFRA label instructions and use conditions issued by the USEPA and CDPR. An annual search is conducted for Material Safety Data Sheets (MSDS) and label updates or revisions for herbicides used. Herbicide applications, including the amount, time, and date of application, are documented on the attached Filed Data Collection Form (Appendix B). Records of applications are maintained in the District office.

3.5.2 Spill Prevention and Response

The District prevents the accidental release of chemicals, fuels, lubricants, and non-storm drainage water into channels using:

1. New District field personnel are appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills.
2. Equipment and materials for cleanup of spills are available onsite, and spills and leaks will be cleaned up immediately and disposed of according to manufacturer's label.
3. Field personnel ensure that hazardous materials are properly handled and natural resources are protected by all reasonable means.
4. Spill prevention kits are always in close proximity when using hazardous materials (e.g., at crew trucks and other logical locations). All field personnel are advised of these locations.
5. Application equipment is regularly checked and maintained to identify and minimize the likelihood of leads developing or equipment malfunction that would lead to a spill.
6. District staff routinely inspect the work site to verify that spill prevention and response measures are properly implemented and maintained.
7. Applicators report spills as required by County policy and in a manner consistent with local, state, and federal requirements.

For small spills on impervious surfaces, absorbent materials are used to remove the spill rather than hosing it with water. For small spills on pervious surfaces such as soil, the spill is controlled with berms and absorbent matrix, excavated, and properly disposed.

3.5.3 Applicator Training

District staff that handle and apply herbicides are trained annually on proper herbicide handling and use. Staff are trained by the pesticide distributor or District/county staff with a pesticide applicator certificate obtained from CDPR. Training includes review of the BMPs included in this document, with particular focus on target and non-target plants, environmental impact avoidance measures, and herbicide label requirements. The District ensures that applicators are properly trained in handling and use of herbicides and have a current Qualified Applicator Certificate (QAC) or Qualified Applicator License (QAL). A QAC/QAL must complete 20 hours of continuing education every two years to stay licensed and remain up to date on the latest techniques for pest control.

3.5.4 Planning and Coordination

Weather conditions are monitored prior to the selected application date. Application is conducted on days with calm wind and no precipitation forecasted.

At least 15 days prior to the first application of algaecide or aquatic herbicide, ACID notifies potentially affected public agencies. ACID posts the notification on its website. Notifications include the following information:

1. A statement of ACID'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 Discharger.

Additional signage is posted along the canal to notify the public of the herbicide application.

4.0 EXAMINATION OF ALTERNATIVES

4.1 Mechanical Removal

Mechanical removal of aquatic vegetation in canals includes hand-pulling weeds or use of a motor-driven weed harvester to pull up and remove vegetation. Both of these methods are labor intensive per the length of water treated. Mechanical removal places personnel at risk of general water slip, trip, and fall hazards and drowning. Additionally, for motorized removal, the additional hazard of a fuel or oil spill exists. Mechanical removal also may create waterborne sediment and turbidity and spread targeted species through fragmentation.

With the large extent of the ACID canal and lateral system, the associated cost and risks make mechanical removal infeasible.

4.2 Controlled Burns

The controlled burn option is suitable for controlling some types of emergent and terrestrial weeds. However, this approach is not suitable for submerged or floating aquatic vegetation and not feasible for use in canals.

4.3 Grazing

As with the controlled burn option, grazing is most suitable for emergent and terrestrial weeds and would not impact submerged and floating vegetation in canals. This option is not a suitable control method.

4.4 Tilling or Disking

This option is not suitable for the control of aquatic vegetation.

4.5 No Controls

This technique is used as feasible.

5.0 MONITORING PROGRAM

This Monitoring and Reporting Program is designed to address the two key questions:

Question No. 1: Does the residual algaecides and aquatic herbicides discharge cause an exceedance of receiving water limitations?

Question No. 2: Does the discharge of residual algaecides and aquatic herbicides, including active ingredients, inert ingredients, and degradation byproducts in any combination cause or contribute to an exceedance of the "no toxics in toxic amount" narrative toxicity objective?

The following monitoring is required for each application event:

1. **Background Monitoring:** Background monitoring samples are collected at the application area just prior to the application event.
2. **Event Monitoring:** Event monitoring samples are collected downstream of the treatment area, in flowing waters, immediately after the application event, but after sufficient time has elapsed such that treated water would have exited the treatment area.
3. **Post-Event Monitoring:** Post-event monitoring samples are collected within the treatment area within one week after application.

The irrigation canal does not discharge to receiving waters, negating the potential to cause an exceedance of any receiving water limitations. Additionally, flows are reduced to 100 cubic feet per second to safeguard against potential overflow from the canal to another waterbody.

Monitoring requirements are outlined in Table 2 and further discussed in the following sections as outlined in Attachment C of the General Permit.

Table 2
MONITORING REQUIREMENTS

Sample Type	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Requirement	Required Analytical Test Method
Visual	1. Monitoring area description 2. Appearance of waterway (sheen, color, clarity, etc.) 3. Weather conditions	NA	Visual Observation	All application sites	Background, Event; Post-Event Monitoring	Not applicable
Physical	1. Temperature	°F	Grab	Each application event	Background, Event; Post-Event Monitoring	Thermometer
	2. pH	S.U.				Electrode
	3. Turbidity	NTU				EPA 180.1
	4. Electrical Conductivity	µmhos/cm				EPA 120.1
Chemical	1. Acrolein	µg/L	Grab	Each application event	Background, Event; Post-Event Monitoring	EPA 624
	2. Dissolved oxygen	µg/L				Electrode

5.1 Monitoring Locations

Background monitoring samples are collected immediately upstream of the application sites at Canyon Road, Locust Road, and Crowley Gulch. Samples are collected at the three application sites the afternoon prior to the initial application event.

Event monitoring samples are collected immediately upstream of the Locust Road application site 48 hours following the initial herbicide application to allow sufficient time for herbicide reaction and to allow treated water to pass. Event monitoring for the second-day applications are collected upstream of the Crowley Gulch application site and at the Floyd Road canal intersection 48 hours following herbicide application.

Post-event monitoring is performed no more than seven days following herbicide location. Post-event monitoring is conducted immediately below the Canyon Road application site, immediately upstream of the Locust Road application site, immediately upstream of the Crowley Gulch siphon, and at the Floyd Road canal intersection seven days following initial herbicide application at Canyon Road.

Application monitoring times and locations are summarized in Table 3.

Table 3
APPLICATION MONITORING TIMES AND LOCATIONS

Monitoring Type	Location	Sample Day	Sample Time
Background	Canyon Road Application Site	One day prior to Day 1 application at Canyon Road	Late afternoon
	Locust Road Application Site		
	Crowley Gulch Application Site		
Event	Upstream of Locust Road Application Site	48 hours after the Day 1 application at Canyon Road	6 am
	Upstream of Crowley Gulch Application Site	48 hours after the Day 2 application at Locust Road	6 am
	Canal intersection at Floyd Road	48 hours after the Day 2 application at Crowley Gulch	9am
Post Event	Below Canyon Road Application Site	7 days after the Day 1 application at Canyon Road	Early to mid-morning
	Below Locust Road Application Site		
	Below Crowley Gulch Application Site		
	Canal intersection at Floyd Road		

5.2 Sampling Procedures

Sampling and sample preservation procedures are conducted in accordance with the current edition of *Standard Methods for the Examination of Water and Wastewater* by the American Public Health Association, per SWRCB 97-03-DWQ and 40 CFR Part 136. Laboratory analyses are conducted according to the test procedures described in 40 CFR Part 136 by a laboratory certified for the required analyses by the State Department of Health Services.

Water samples are collected using a sampling rod and pre-cleaned amber glass 1-liter bottles provided by the laboratory. Laboratory-supplied sample bottles are obtained well ahead of time prior to planned application events. Monitoring instruments used to measure pH, specific conductance, temperature, and dissolved oxygen are calibrated and maintained in accordance with manufacturers' specifications to ensure accuracy.

Sampling supplies are maintained at all times during the irrigation season, with content and equipment evaluation evaluated prior to an application event. Supplies include sample bottles (including spare bottles), field data collection form (included in Appendix B), clipboard, sampling pole, disposable nitrile gloves, waterproof pens, sample cooler, field multi-parameter probe, and camera.

The sample ID number is determined by the following protocol: a four-letter code unique to the site, followed by the time since the application (e.g. "pre" for the baseline sample, the number of hours since the application for the treatment sample, or "1w" for the one-week post treatment). For example, "CANR-01-pre-1h" translates to "Canyon Road, pre-treatment sample, 1 hour prior to application."

Sample collection is conducted to ensure samples are representative of canal water. Sample bottles are filled directly from the canal – never collected in a container first and then transferred to the sample bottle. To collect the sample, the bottle is attached to the sampling rod with a clean clamp or zip-tie, extended out over the water at the application site, and lowered to mid-water column depth. When full, the bottle is pulled back out of the water and the cap is affixed to the mouth of the bottle. The sample is labeled in permanent ink with the sample ID number and date, time, and initials of the sampler. Immediately following collection, samples are placed directly into laboratory-supplied coolers, on ice, and transferred to a California-certified analytical laboratory.

To help assess contamination from field equipment, ambient conditions, sample containers, transit, and the laboratory, one trip blank is collected and submitted to the laboratory for analysis annually using distilled water. Field blank samples are prepared by pouring distilled water into a pre-cleaned sampling container at the sampling point.

5.2.1 Sample Shipment

Following collection, water samples are stored in a cooler with ice packs and hand-delivered or shipped for priority overnight delivery to a California state-certified laboratory. If samples are not shipped or delivered until the following day, they are stored in a cooler on ice until they can be transferred to a refrigerator, and subsequently transferred back into a cooler for shipping.

5.3 Visual Monitoring

In conducting visual sampling, a log is maintained of the canal water conditions prior to and following treatment. Notes are made regarding the presence or absence of the following:

- Floating or suspended matter
- Discoloration

- Bottom deposits
- Aquatic life
- Visible films, sheens, or coatings
- Fungi, slimes, or objectionable growths
- Potential nuisance conditions

Notes on receiving water conditions are summarized in the monitoring report. Before and after photographs may also be taken to document changes in site conditions with treatment.

5.4 Recordkeeping

At each sampling location, the sample ID number, time and date of sampling, and sampling depth are recorded. Field measurements for water temperature, pH, dissolved oxygen, and specific conductance are also recorded. Any other unusual conditions or concerns are noted, including any fish, birds, or other wildlife present.

Data from these field forms are entered into an electronic spreadsheet for processing. Field data log sheets are maintained for at least five years in the District office. A template used when conducting field monitoring is included in Appendix B.

6.0 REPORTING

ACID prepares and submits an annual report to the RWQCB Executive Officer by March 1 of each year. The report presents monitoring data and evaluates whether discharge of aquatic herbicides, their residues, or their degradation byproducts occurred.

The annual report contains the following information:

1. An executive summary discussing compliance or violation of this General Permit and the effectiveness of the APAP to reduce or prevent the discharge of pollutants associated with aquatic herbicide applications;
2. A summary of monitoring data, including the identification of water quality improvements or degradation as a result of the aquatic pesticide application, if appropriate, and recommendations for improvements to the APAP (including proposed BMPs) and monitoring program based on the monitoring results. All receiving water monitoring data will be compared to receiving water limitations and receiving water monitoring triggers;
3. Identification of BMPs currently in use and a discussion of their effectiveness in meeting the requirements in this General Permit;
4. A discussion of BMP modifications addressing violations of this General Permit;
5. A map showing the location of each treatment area;
6. Types and amounts of aquatic herbicides used at each application event;
7. Information on surface area and/or volume of treatment areas and any other

information used to calculate dosage, concentration, and quantity of each algaecide and aquatic herbicide used;

8. Sampling results indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude or township/range/section if available), detailed map or description of each sampling area (address, crossroads, etc.), collection date, name of constituent/parameter and its concentration detected, 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 are tabulated so that they are readily discernible; and
9. Summary of algaecide and aquatic herbicide application log.

Additionally, in the unexpected event of noncompliance, ACID reports to the State Water Board and Central Valley Regional Water Board including any unexpected or unintended effect of an aquatic herbicide use that may endanger health or the environment. Any information is provided orally within 24 hours from the time ACID becomes aware of the circumstances with a written report following within five days from the known noncompliance.

Appendix A

Magnacide Application and Safety Manual

NOT REVIEWED
In Accordance with PR Notice 82-2.
Based on Draft Labeling Dated

MAGNACIDE® H Herbicide

APPLICATION AND SAFETY MANUAL

EPA Registration Number 10707-9

MAGNACIDE® H Herbicide

APPLICATION AND SAFETY MANUAL

EPA Registration Number 10707-9

Manual Revision Date: July 2001

Supersedes: April 1997

Baker Petrolite Corporation makes no warranty of merchantability, fitness for any purpose or otherwise, expressed or implied, concerning this product or its uses which extend beyond the use of the product under normal conditions in accord with the statements made in this manual.

PLEASE SIGN AND RETURN

The attached MAGNACIDE® H Herbicide Application and Safety Manual contains instructions for use concerning this label. Federal law requires that this handbook be in the possession of the applicator. Please acknowledge receipt of this handbook by signing below and returning this page to the address listed below.

Baker Petrolite Corporation
P. O. Box 11192
Bakersfield, CA 93389

_____ _____

Signature Date

_____ _____

Title or Capacity Firm or Organization

RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLIOCATOR'S CERTIFICATION.

Manual Revision Date: July 2001

TABLE OF CONTENTS

I. INTRODUCTION 1
Table 1. Acrolein Container Sizes 1

II. CONTROLLING SUBMERGED AQUATIC VEGETATION WITH MAGNACIDE® H HERBICIDE 2
A. Introduction 2
B. Mode of Action on Plants 2
C. Weed Specificity 2

III. PRECAUTIONARY STATEMENTS 3
A. Hazards to Humans and Domestic Animals 3
B. First Aid 3
1. If Inhaled 4
2. If on Skin or Clothing 4
3. If in Eyes 4
4. If Swallowed 4
5. Note to Physician 4
C. Environmental Hazards Statement 4

IV. RECOMMENDATIONS FOR THE PROPER HANDLING OF MAGNACIDE® H HERBICIDE 5
A. Physical and Chemical Properties 5
B. Fire and Polymerization Hazards 5
C. Health Hazards 6
Table 2. Occupational Exposure Levels for Acrolein 6
D. Process Safety Management 6
E. Personal Protective Equipment Use 6
F. MAGNACIDE H® Herbicide Storage 7
G. Disposal 7

V. SPILL AND FIRE CONTROL PROCEDURE 7
A. General Information 7
B. Recommended Procedure for Handling Spills 7
C. Recommended Fire Control 7

VI. DIRECTIONS FOR USE 8
A. Guide for MAGNACIDE® H Herbicide Application from Cylinders and Portable Skid Tanks 8
B. Preventive Maintenance Program 8
C. MAGNACIDE® H Herbicide Application Guide 9
Table 3. Weed Growth Condition Chart 9
Table 4. Orifice Flow Table 12
Table 5. MAGNACIDE® H Herbicide Concentrations 12

VII. APPLICATIONS FROM CYLINDERS AND SKID TANKS 13
A. General Instructions 13
B. Application Instructions 13
C. Shutdown Procedure 15

VIII. MAGNACIDE® H Herbicide APPLICATION SET UP INDEX 16
Figure 1. MAGNACIDE® H Application Set Up 17

IX. MAGNACIDE® H Herbicide KIT INDEX 18
Figure 2. MAGNACIDE® H Application Kit 19

X. EQUIPMENT AND HARDWARE 20

XI. TRANSPORTING MAGNACIDE® H Herbicide CONTAINERS 20

XII. RETURN OF EMPTY MAGNACIDE® H Herbicide CONTAINERS 20
A. Preparation for Shipment of Empty Containers 21

XIII. DISCLAIMER 21

APPENDIX A. Water Measurement Equivalents 22

APPENDIX B. MAGNACIDE® H Herbicide Monitor 23

APPENDIX C. Toxicity 24

APPENDIX D. Specimen MAGNACIDE® H Herbicide Label 25

I. INTRODUCTION

This manual provides information on the proper application and handling of MAGNACIDE® H Herbicide (active ingredient: acrolein, inhibited). MAGNACIDE® H Herbicide is registered with the U.S. Environmental Protection Agency (EPA) under Registration Number 10707-9 for the control of submersed and floating weeds and algae in irrigation canals. The legal uses of MAGNACIDE® H Herbicide are limited to those listed on the EPA registered product label, this manual, and applicable 24(c) (Special Local Need) registrations.

This product is toxic by inhalation; therefore, EPA has classified MAGNACIDE® H Herbicide as a RESTRICTED USE PESTICIDE for retail sale to, and use only by, certified applicators or persons under their direct supervision and only for those uses covered by the certified applicator's certification. The various states each have different requirements concerning record keeping for restricted use pesticides. Contact the appropriate agency in your state for further information.

MAGNACIDE® H Herbicide controls submersed and floating vegetation in irrigation canals. Since 1956 hundreds of field trials have been conducted in the United States using MAGNACIDE® H in cooperation with public and private agencies. In addition, MAGNACIDE® H Herbicide has been widely used for commercial applications since 1959.

MAGNACIDE® H Herbicide is extremely water soluble. Applications are made by injecting the chemical into the flowing water at a point of good mixing, such as downstream of a weir or siphon. Once mixed, the MAGNACIDE® H Herbicide travels downstream as a wave of treated water, bathing the unwanted aquatic vegetation with herbicide. Once the wave of treated water has passed a particular point in the canal, the concentration of MAGNACIDE® H Herbicide at that point drops to zero. No residual chemical remains after passage of the wave. MAGNACIDE® H Herbicide-treated water can be used for irrigation. At use concentrations, MAGNACIDE® H has been found to be compatible with the commonly used materials of construction in drip and conventional irrigation equipment.

Effective dosages range from 1 part per million (ppm, parts of MAGNACIDE® H Herbicide per 1,000,000 parts water) to 15 ppm. In irrigation canals, submersed weed control is obtained at these dosages with application times ranging from 30 minutes to 8 hours. All typical submersed aquatic weed species and algae are susceptible. Floating forms such as watercress, water hyacinth and water primrose are typically not completely controlled at label rates. Emergent species, such as cattails and tules, are not affected.

Although acrolein, the active ingredient in MAGNACIDE® H Herbicide, is toxic, flammable, highly reactive chemically, and a lachrymator, the process of controlling submerged weeds with this product can be carried out safely and effectively. Specialized application equipment permits introduction of MAGNACIDE® H Herbicide with minimal handling. MAGNACIDE® H Herbicide is supplied in United States Department of Transportation (DOT) specification pressurized containers. It is directly forced through a metering device into the irrigation canal, using industrial grade nitrogen gas (typically containing 10 ppm or less of oxygen).

MAGNACIDE® H Herbicide is available in a variety of container sizes, all of which meet DOT specifications for acrolein, inhibited. Container sizes are shown in Table 1.

Table 1. Acrolein Container Sizes

Container Type	Acrolein Net Weight (lbs.)	Acrolein Volume at 60° F (gallons)
Cylinder	58	8.2
Cylinder	370	52.4
Portable Skid Tank	2,300	326.0
Portable Skid Tank	2,450	347.0
Portable Skid Tank	2,500	354.0
Portable Skid Tank	3,000	425.0

All orders are F.O.B. Taft, California. Round trip freight charges for the containers are included in the product billing. Empty containers are to be returned to Taft, California.

Those interested in the commercial application of MAGNACIDE® H Herbicide should contact:

Baker Petrolite Corporation
Crop Protection Chemicals
P. O. Box 11192
Bakersfield, CA 93389
Telephone: (661) 763-5137
FAX: (661) 765-6046
E-mail address: cropprotectionchemicals@bakerpetrolite.com

II. CONTROLLING SUBMERSED AQUATIC VEGETATION WITH MAGNACIDE® H Herbicide

A. Introduction

Aquatic vegetation is a serious pest in many waterways of the world. This is particularly true in irrigation canals where weeds and algae reduce flow below that of the designed capacity of the channel. Unhampered weed growth causes the water level to rise, thus increasing the chance of overflow and levee breaks. Weeds collect silt and debris, necessitating periodic costly cleanouts. Occasionally these weeds break loose, clogging weirs, siphons and other canal structures. Control of this vegetation is a costly, but necessary part of the maintenance of these systems. The process of controlling submersed aquatic vegetation with MAGNACIDE® H Herbicide as described in this manual is an effective means of overcoming many of these problems.

B. Mode of Action on Plants

MAGNACIDE® H Herbicide is a general cell toxicant that reacts with various vital proteins. The dead plant tissues gradually disintegrate and float downstream, without releasing any large masses of vegetation to clog canal structures. The weeds disintegrate slowly and clear out over a period of 3 or 4 days to 2 weeks, depending on the temperature. The time for restoration of the canal to full capacity will, of course, depend on the rate at which the weeds die and disintegrate. However, an increase in capacity may be apparent in a few hours, as the weeds become flaccid.

C. Weed Specificity

MAGNACIDE® H Herbicide appears to be toxic to all submersed algae and weeds. While algae species were easily controlled, pondweeds such as *Zannichellia* sp. and *Potamogeton crispus* were more easily controlled than the forms which also have floating leaves such as *P. nodosus* and *P. illinoensis*. The latter pondweeds are best controlled when immature. Baker Petrolite Corporation has conducted efficacy studies on *Anabaena flos-aquae*, *Lemna gibba*, *Navicilla pelliculosa*, *Selenastrum capricornutum* and *Skeletonema costatum*.

The following species have been controlled by recommended label use rates:

Algae:

Anabaena flos-aquae	(blue-green algae)
Chara sp.	(stoneworts)
Cladophora sp.	(green algae)
Cladophora glomerata	(green algae)
Hydrodictyon reticulatum	
Navicilla pelliculosa	(freshwater diatom)
Selenastrum capricornutum	(green algae)
Skeletonema costatum	(marine diatom)
Spirogyra sp.	(green algae)

Submersed Aquatic Weeds:

Callitriche sp.	(water starwort)
Ceratophyllum demersum	(coontail)
Elodea canadensis	(waterweed)
Heteranthera dubia	(waterstargrass)
Lemna gibba	(duckweed)
Potamogeton crispus	(curlyleaf pondweed)
Potamogeton foliosus	(leafy pondweed)
Potamogeton illinoensis	(pondweed)
Potamogeton nodosus	(American pondweed)
Potamogeton obtusifolius	(pondweed)
Potamogeton pectinatus	(sago pondweed)
Potamogeton richardsonni	(richardson pondweed)
Najas sp.	(naiad)
Zannichellia palustris	(horned pondweed)

III. PRECAUTIONARY STATEMENTS

A. Hazards to Humans and Domestic Animals

DANGER. EXTREMELY FLAMMABLE AND IRRITATING VAPOR AND LIQUID. POISONOUS BY INHALATION, SKIN CONTACT OR SWALLOWING. DO NOT BREATHE VAPOR. CORROSIVE. CAUSES EYE AND SKIN DAMAGE. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. KEEP AWAY FROM FIRE, SPARKS AND HEATED SURFACES.

When setting up and breaking down application equipment, a full-face air purifying respirator with organic vapor (OV) cartridges jointly approved by the Mine Safety and Health Administration (MSHA) and the National Institute of Occupational Safety and Health (NIOSH) and butyl rubber gloves must be worn. For visual inspection during treatment, chemical splash goggles must be worn. If spilled on clothing, gloves, or shoes, remove them immediately and wash thoroughly with soap and water before reuse. Use with adequate ventilation.

B. First Aid

Have the product container, label or application and safety manual with you when calling a poison control center or doctor, or going for treatment. CALL A PHYSICIAN IMMEDIATELY IN ALL CASES OF SUSPECTED POISONING.

1. 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.

2. 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.

3. 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 five minutes, then continue rinsing eye.
- Call a poison control center for treatment advice.

4. 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 the poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

5. Note to Physician

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

WARNING SIGNS AND SYMPTOMS: Liquid MAGNACIDE® H Herbicide is absorbed by the skin and is particularly irritating to any lesion and to the eye. The vapors act principally on the mucous membrane of the eyes and respiratory tract. Because of the extreme lachrymatory warning effect, the concentration tolerable by man is far below the minimum lethal concentration.

TREATMENT: Treat exposed area as a chemical burn. Thoroughly flush eyes with water and treat symptomatically. Persons exposed to MAGNACIDE® H Herbicide vapors have a delayed reaction and experience irritation of the respiratory tract. In severe cases, this may progress to pulmonary edema. Therefore, it is advisable to keep persons exposed to MAGNACIDE® H Herbicide under observation for 24 hours following exposure.

C. Environmental Hazards Statement

This product is toxic to fish and wildlife. Keep out of lakes, streams or ponds. Fish, shrimp and crabs will be killed at application rates recommended. Do not apply where they are important resources. Do not apply to water drainage areas where runoff or flooding will contaminate ponds, lakes, streams, tidal marshes and estuaries. Do not contaminate water by cleaning of equipment or disposal of wastes. Notify your state Fish and Game Agency before applying this product. Use only as specified.

IV. RECOMMENDATIONS FOR THE PROPER HANDLING OF MAGNACIDE® H Herbicide

This section has been developed to inform the applicator of the required handling methods for MAGNACIDE® H Herbicide. It summarizes the importance of proper storage, chemically compatible hardware, use of safety equipment, disposal, fire control, first aid and other safety related issues. All persons who handle MAGNACIDE® H Herbicide should be trained thoroughly in correct operation techniques. They should be completely familiar with its properties and with proper emergency procedures.

A. Physical and Chemical Properties

MAGNACIDE® H Herbicide is a formulation containing a minimum of 95% (by weight) acrolein as the active ingredient. Some of the typical physical and chemical properties are shown in the following list.

Formula	(CH_2=CH-CHO)
Molecular weight	56.06
Appearance	clear, colorless to light yellow liquid
Odor	aldehydic (extremely irritating)
Specific gravity at 60°F	0.847
Pounds per gallon at 60°F	7.06
Boiling point (@760 mmHg)	127°F
Freezing point	-124°F
Vapor density	1.93 (air = 1.0)
Flash point	
Tag open cup	-20°F (approx.)
Tag closed cup	-13°F (approx.)
Flammability limits in air	
Lower limit	2.8% (by volume)
Upper limit	31.0% (by volume)
Solubility at 20°C	
Acrolein in water	22% by weight
Water in acrolein	7% by weight
Vapor pressure at 100°F	8.6 psia
Coefficient of expansion at 59°F	0.000762 per degree F
Viscosity at 32°F (Abs.)	0.43 cps
Permissible Exposure Level (PEL)*	0.1 ppm

**PEL as defined by OSHA, United States Department of Labor*

B. Fire and Polymerization Hazards

MAGNACIDE® H Herbicide is a highly volatile liquid. In certain combinations with air, vapors can have an explosive potential if ignition sources are present. Keep away from all sources of heat, sparks and flame.

Liquid MAGNACIDE® H Herbicide is highly chemically reactive and readily forms polymers generating tremendous heat. Contamination of neat material with air, alkalies, or strong acids can initiate polymerization. Contamination with all foreign materials must be avoided. If the product is stored or handled improperly, the polymerization may proceed with sufficient violence to rupture the container.

MAGNACIDE® H Herbicide polymerizes slowly in the presence of air. Therefore, all containers are packaged with a blanket of nitrogen to exclude air. To avoid the possibility of air contamination during use, MAGNACIDE® H Herbicide must be pressured from the container with industrial grade nitrogen (typically containing 10 ppm or less of oxygen). In addition, hydroquinone is added to inhibit oxygen-catalyzed polymerization. However, hydroquinone does not inhibit polymerization catalyzed by alkalies and strong acids.

C. Health Hazards

The occupational exposure levels for acrolein, the active ingredient in MAGNACIDE® H Herbicide are shown in Table 2.

Table 2. Occupational Exposure Levels for Acrolein

PEL (OSHA)	ACGIH
TWA	Ceiling
0.1 ppm	0.1 ppm

PEL = Permissible Exposure Level
OSHA = Occupational Health and Safety Administration
TWA = Time-Weighted Average
ACGIH = American Conference of Governmental Industrial Hygienists
Ceiling – the concentration that should not be exceeded even instantaneously

MAGNACIDE® H Herbicide vapor is toxic and a strong irritant (lachrymator). It is extremely irritating to the eyes, nose, throat and lungs. However, it is practically impossible to unknowingly remain in a vapor-contaminated atmosphere long enough to produce serious physiological effects because of its high lachrymatory activity. The vapor concentration tolerable to man (0.1-1 ppm in air) serves as a warning of its presence and is far below the minimal lethal concentration. Chronic toxicity studies have not revealed any cumulative effects. However, overexposure to the vapor can result in serious injury to the lungs. Additional information is found in Appendix C, *Toxicity*.

Eye contact with MAGNACIDE® H Herbicide liquid will produce severe damage; the chemical must be removed immediately by flushing with large quantities of water. Skin contact with liquid MAGNACIDE® H Herbicide can cause skin irritations ranging from simple reddening of the skin to severe blistering (see "First Aid" section of this manual).

Symptoms of exposure to MAGNACIDE® H Herbicide include irritation of the eyes, throat, and skin, reddening or blistering of the skin, headaches, acute distress in affected areas and cessation of breathing. There is no emergency antidote for MAGNACIDE® H Herbicide.

D. Process Safety Management

Personnel should be aware of the requirements of OSHA Standard 1910.119, Process Safety Management of Highly Hazardous Chemicals. The major objectives of process safety management (PSM) of highly hazardous chemicals is to prevent unwanted releases of hazardous chemicals especially into locations which could expose employees and others to serious hazards. With regard to MAGNACIDE® H Herbicide, PSM applies to a process involving acrolein at or above the 150-pound threshold quantity. To ensure compliance, consult local, state and federal safety regulations.

E. Personal Protective Equipment Use

The applicator, to protect from an accidental splash or spray, must wear a full-face air purifying respirator, with organic vapor (OV) cartridges jointly approved by the Mine Safety and Health Administration (MSHA) and the National Institute of Occupational Safety and Health (NIOSH).and butyl rubber gloves.

Applicators must also have fresh water available in case of accidental irritation to the eyes or skin from MAGNACIDE® H Herbicide liquid or vapors. In addition, the applicator must have a ten (10) pound dry chemical fire extinguisher at his disposal when working with MAGNACIDE® H Herbicide. All of the equipment mentioned above must be provided for the applicator's use during each application. Personnel who may be involved with the storage, transportation, use, disposal or emergency response of MAGNACIDE® H Herbicide must be trained in the safety and health aspects of acrolein, including, but not limited to, the use of personal protective equipment, respiratory protection and emergency response as explained in the relevant OSHA standards.

F. MAGNACIDE® H Herbicide Storage

All containers of MAGNACIDE® H Herbicide should be stored in a secured, well-ventilated area, away from all other chemicals. No alkalies or oxidizing materials should be near. Any electrical equipment should be Class 1 - Division 2 and properly grounded. Do not reuse empty container. Return empty containers to Baker Petrolite Corporation.

If MAGNACIDE® H Herbicide is stored at a single location in quantities greater than 5,000 pounds net, a Risk Management Plan is required. To ensure compliance, consult local, state and federal regulations.

G. 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.

V. SPILL AND FIRE CONTROL PROCEDURE

A. General Information

MAGNACIDE® H Herbicide spills can be deactivated using sodium carbonate (soda ash). This will polymerize the spill forming a hard odorless polymer. Sodium carbonate is to be added to the spill in powder form followed by 10 to 20 volumes of water. The deactivated polymer can then be placed in marked containers for disposal in an approved hazardous waste disposal facility. Never flush MAGNACIDE® H Herbicide into sewers or natural waterways as this can result in biological upset of treatment systems or kill fish in waterways.

B. Recommended Procedure for Handling Spills

1. All personnel responding to a spill of MAGNACIDE® H Herbicide must have completed the appropriate training as outlined in 29 CFR 1910.120 (q), Emergency Response to Hazardous Substance Releases.
2. Evacuate all nonessential personnel to an upwind area.
3. All decontamination personnel must wear self-contained breathing apparatus and appropriate protective clothing.
4. Contain spill by diking with dirt.
5. Add sodium carbonate (soda ash) to the spill in powdered form. Follow by dilution and mixing with water.
6. When deactivation is complete, scoop the polymer in properly marked containers for disposal at an approved hazardous waste disposal facility in compliance with state and/or federal requirements.

C. Recommended Fire Control

Pursuant to local regulations, the appropriate fire department should be notified of the location where MAGNACIDE® H Herbicide is stored.

MAGNACIDE® H Herbicide is highly flammable and produces toxic vapors. All fire fighting personnel must wear self-contained breathing apparatus and protective clothing.

Carbon dioxide or dry chemical extinguishers can be used on small fires. Alcohol-type foam is

recommended for large fires. If the fire can be tolerated without endangering additional personnel or property, then it should be left to burn itself out.

Water spray may be effective if used in large quantities, at least 20 volumes of water per volume of MAGNACIDE® H Herbicide. Use water spray to help disperse vapors and cool containers. For additional details, reference the acrolein Emergency Response Plan (ERP).

VI. DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling. MAGNACIDE® H Herbicide is a water soluble material for the control of submersed and floating weeds and algae in irrigation canals. This material must be applied in accordance with directions in the MAGNACIDE® H Herbicide Application and Safety Manual by a certified applicator or under a certified applicator's supervision. Do not permit dairy animals to drink treated water. Do not use where waters will flow into potential sources of drinking water. Water treated with MAGNACIDE® H Herbicide must be used for irrigation of fields, either crop bearing, fallow or pasture, where the treated water remains on the field OR held for 6 days before being released into fish bearing waters or where it will drain into them.

Information contained in the following pages of this manual will assist the applicator in determining: (1) the proper size orifice through which MAGNACIDE® H Herbicide should be applied; (2) the nitrogen application pressure which should be used; and (3) the proper setup and shut down of the MAGNACIDE® H Herbicide Application Equipment as distributed by Baker Petrolite Corporation.

A. Guide for MAGNACIDE® H Herbicide Application from Cylinders and Portable Skid Tanks

MAGNACIDE® H Herbicide is forced from the container using nitrogen gas and introduced directly into the canal over a period of 15 minutes to 8 hours to form a wave of treated water. Because of its high activity against submersed vegetation, concentrations in the range of 1-15 ppm are required for control. As MAGNACIDE® H Herbicide proceeds down the canal, it moves like a chemical wave, destroying weeds as it moves.

The amount of MAGNACIDE® H Herbicide required is primarily determined by the amount of water flow and weed density in the canal, although velocity, water temperature and water quality must also be considered. Canal flow is generally stated in cubic feet per second (cfs) and the amount of material used can also be expressed in terms of this value. As an example, if MAGNACIDE® H Herbicide is recommended at 1 gallon/cfs, it means that for a canal flowing 10 cfs a total of 10 gallons of material will be needed.

Since MAGNACIDE® H Herbicide is added over a time interval, a wave of treated water is formed that moves downstream, bathing the weeds in herbicide. Once the wave of treated water has passed a particular point in the canal, the concentration of MAGNACIDE® H Herbicide at that point drops to zero. No residual chemical remains after passage of the wave. The amount of herbicide the weeds receive is, therefore, determined by (1) its concentration in the water and (2) the time required for the treated water to pass over the plants. In fast flowing canals (linear velocity greater than 2.5 ft/sec), masses of vegetation may be compacted or bent by the water; channeling will occur preventing the free movement of the treated water through the weeds. . The same situation may prevail in canals heavily infested with weed growth. Consequently, all plants may not receive their proportionate share of the available herbicide and control will be less effective. Therefore, in canals flowing faster than 2.5 ft/sec, the time period of treatment may need to be extended to allow more contact time.

B. Preventive Maintenance Program

By utilizing a preventive maintenance program, the irrigation system will be kept free of weeds throughout the irrigation season, solving water delivery problems and minimizing off-season maintenance created by aquatic weeds. Preventive maintenance programs require less herbicide usage. Better application results will also

be obtained, as the weeds are more susceptible while immature.

It has been determined through various field studies that the most effective and economical method of aquatic weed control is obtained by utilization of a preventive maintenance program. A preventive maintenance program consists of making a series of MAGNACIDE® H Herbicide applications over the irrigation season such that the aquatic weeds are never allowed to reach a "problem" condition. The first MAGNACIDE® H Herbicide application should be made as soon as aquatic weed growth appears (Weed Condition Code A or B). This will normally occur 3 - 6 weeks after the canal receives a constant supply of water. The second and subsequent applications should be made at two to three week intervals, depending upon the regrowth of aquatic weeds. Regrowth will depend on several variables such as water and atmospheric temperatures, species of aquatic plant, turbidity of water, water quality and sunlight conditions.

C. MAGNACIDE® H Herbicide Application Guide

To determine the proper orifice size and nitrogen pressure setting, the following must be determined:

1. The weed growth condition of the canal – Naturally, the more severe the weed growth condition, the more MAGNACIDE® H Herbicide which will be required for control. Use Table 3, Weed Growth Condition Chart, below, to determine the weed growth condition and gallons of MAGNACIDE® H Herbicide per cubic foot per second (cfs).

Table 3. Weed Growth Condition Chart

Condition Code			MAGNACIDE® H Herbicide per cfs
A.	Little algae and pondweed less than 6 inches long	=	0.17 gallons per cfs (for preventive maintenance)
B.	Algae (non-floating) and pondweed less than 12 inches long	=	0.25 gallons per cfs (for preventive maintenance)
C.	Algae (some floating) and pondweed 12 - 24" long	=	0.50 gallons per cfs
D.	Algae (some floating) and mature pondweed	=	1.0 gallons per cfs
E.	Choked conditions	=	1.5 gallons per cfs

NOTE: Water temperatures also affect the amount of MAGNACIDE® H Herbicide required for effective treatment. MAGNACIDE® H Herbicide is less soluble in cooler water and plant reactivity is lowered. The above conditions are for water temperatures above 60°F. Correct the amount of MAGNACIDE® H Herbicide required for effective treatment as follows:

Water Temperatures	Increase Amount of MAGNACIDE® H Herbicide
60°F - 55°F	20%
55°F - 50°F	50%
50°F or below	100%

2. Canal rate of flow – The volume of water that passes a particular reference section in a unit of time. Usually designated as cubic feet per second (cfs). Calculated as mean depth in feet times mean

width in feet times the linear velocity in feet per second.

3. Determine the temperature of the canal water to be treated.

4. Application Time: Normal application times will range from 15 minutes to 8 hours. Items to be considered in selecting an application time are:

   a. Contact time: Since MAGNACIDE® H Herbicide is a contact herbicide, consider the velocity of the canal. In fast flowing canals (2 mph or more) extend the application time to insure good contact. In slower canals (0.5 mph or less), shorten the application time.

   b. Concentration of MAGNACIDE® H Herbicide in parts per million (ppm): The concentration may be controlled by adjusting the application time. Concentrations must not exceed 15 ppm. See Table 5, MAGNACIDE® H Herbicide Concentrations.

After you have determined the above items you can calculate the orifice size and nitrogen pressure setting.

Example A:

1. Weed growth condition: Some algae and pondweed 10 inches in length.
2. Canal rate of flow is 50 cfs.
3. Temperature of 65°F.
4. Application time 3 hours.

Step 1

From Table 3, Weed Growth Condition Chart, we determine a Condition Code B, or 0.25 gallons of MAGNACIDE® H Herbicide per cfs. **NOTE:** Temperature is above 60°F.

Step 2

Determine total gallons of MAGNACIDE® H Herbicide required:
Multiply canal rate of flow (cfs) by weed growth condition code (MAGNACIDE® H Herbicide per cfs) to find the total gallons of MAGNACIDE® H Herbicide required.

50 cfs X 0.25 gallons MAGNACIDE® H Herbicide per cfs = 12.5 gallons of MAGNACIDE® H Herbicide required

Step 3

Determine gallons of MAGNACIDE® H Herbicide per hour. Divide total gallons of MAGNACIDE® H Herbicide by application time to find gallons of MAGNACIDE® H Herbicide per hour.

12.5 gallons MAGNACIDE® H Herbicide / 3 hours = 4.2 gph of MAGNACIDE® H Herbicide

Step 4

Determine orifice size and nitrogen pressure setting. Refer to Table 4, Orifice Flow Table. Locate the gallons per hour of MAGNACIDE® H Herbicide, or the closest number in the table. Read to the left to find the orifice size and read up to find the nitrogen pressure setting. We determine 4.1 gph is the closest number to 4.2 gph and locate the orifice size and pressure setting of:

Orifice Size, Inches	Pressure Setting, psig
0.025	25

Example B:

1. Weed growth condition: Floating algae and floating pondweed 12 - 24" long.
2. Canal rate of flow 120 cfs.
3. Temperature 57°F.
4. Application time 4 hours.

Step 1

From Table 3, Weed Growth Condition Chart, we determine Condition Code C, or 0.50 gallons of MAGNACIDE® H Herbicide per cfs. **NOTE:** Temperature of 57°F will increase rate by 20%.

Step 2

Determine total gallons of MAGNACIDE® H Herbicide required. Multiply canal rate of flow (cfs) by weed growth condition code (MAGNACIDE® H Herbicide per cfs) to find the gallons of MAGNACIDE® H Herbicide. Due to the temperature being below 60°F, we will increase the volume of MAGNACIDE® H Herbicide by 20%.

120 cfs X 0.50 gallons of MAGNACIDE® H Herbicide per cfs = 60 gallons of MAGNACIDE® H Herbicide.

60 gallons MAGNACIDE® H Herbicide x 0.20 (for water temperature) = 12 gallons

60 gallons + 12 gallons = 72 total gallons MAGNACIDE® H Herbicide required

Step 3

Determine gallons of MAGNACIDE® H Herbicide per hour: Divide total gallons of MAGNACIDE® H Herbicide by the application time to find gallons of MAGNACIDE® H Herbicide per hour.

72 total gallons MAGNACIDE® H Herbicide / 4 hours = 18 gph of MAGNACIDE® H Herbicide.

Step 4

Determine orifice size and nitrogen pressure setting. Refer to Table 4, Orifice Flow Table, and locate the gallons per hour of MAGNACIDE® H Herbicide, or the closest number on the table. Read to the left to find the orifice size and read up to find the nitrogen pressure setting. We determine 18.5 gph is the closest number to 18 gph and locate the orifice size and pressure setting:

Orifice Size, Inches	Pressure Setting, psig
0.045	50

The concentration of MAGNACIDE® H Herbicide should not exceed 15 ppm. The concentration in ppm is calculated as follows:

$$\frac{\text{dosage (gal/cfs) x 1,884}}{\text{application time (minutes)}} = \text{ppm (MAGNACIDE® H Herbicide concentration)}$$

Alternately, the treating rate can be calculated using the following formula:

Gallons per Hour (gph) MAGNACIDE® H Herbicide = cfs x 0.032 x MAGNACIDE® Herbicide (in ppm)

Based on the weed growth conditions at the time of treatment, choose the application time and concentration appropriate from Table 5, MAGNACIDE® H Herbicide Concentrations. Insert the flow rate and ppm into the equation and calculate the gallons per hour of MAGNACIDE® H Herbicide required.

Table 4. Orifice Flow Table

Orifice Size (in.)	Nitrogen Pressure Settings									
	6 psig	8 psig	10 psig	15 psig	20 psig	25 psig	30 psig	40 psig	50 psig	60 psig
	Gallons per Hour									
0.014	0.65	0.72	0.85	1.05	1.2	1.3	1.4	1.6	1.9	2.1
0.016	0.85	0.98	1.05	1.3	1.5	1.7	1.9	2.2	2.4	2.6
0.020	1.3	1.5	1.6	2.1	2.4	2.7	2.8	3.3	3.7	4.0
0.025	2.1	2.3	2.6	3.2	3.7	4.1	4.5	5.1	5.9	6.3
0.030	2.8	3.3	3.7	4.6	5.3	5.9	6.4	7.3	8.5	9.2
0.035	3.9	4.5	5.1	6.2	7.2	7.9	9.2	10.5	11.1	12.5
0.045	6.4	7.0	8.5	10.5	11.8	13.1	14.2	16.5	18.5	21.0
0.055	9.8	11.1	12.4	15.0	17.0	20.0	22.0	25.0	27.0	30.0
0.070	15.0	17.0	21.0	25.0	28.0	32.0	35.0	40.0	46.0	49.0
0.081	21.0	24.0	27.0	33.0	38.0	42.0	47.0	53.0	60.0	65.0

Table 5. MAGNACIDE® H Herbicide Concentrations

MAGNACIDE® Herbicide Concentrations Flowing Irrigation Canals Concentration in ppm at Various Gallons/cfs Rates					
Application Time	Weed Condition A Gal/cfs 0.17	Weed Condition B Gal/cfs 0.25	Weed Condition C Gal/cfs 0.50	Weed Condition D Gal/cfs 1.0	Weed Condition E Gal/cfs 1.5
	ppm				
30 Minutes	10.0	-	-	-	-
1 Hour	5.0	7.8	-	-	-
2 Hours	2.6	3.9	7.8	-	-
3 Hours	1.7	2.6	5.2	10.4	-
4 Hours	1.3	2.0	3.9	7.9	11.8
6 Hours	-	1.3	2.6	5.2	7.9
8 Hours	-	1.0	1.9	3.9	5.9

VII. APPLICATIONS FROM CYLINDERS AND SKID TANKS

A. General Instructions

The applicator must wear a respirator when setting up or breaking down application equipment. Once the application equipment is in place, and the treatment in progress, an applicator should monitor the treatment if the containers are not secured. If the containers are secured (e.g., locked enclosures), an applicator may simply check on the treatment periodically (at least every two hours).

Know your procedures thoroughly; rehearse them if necessary before the job. Use only specified equipment as provided by Baker Petrolite Corporation. Application equipment should be inspected prior to and during each application to insure that it is working properly.

Turn all valves cautiously, insuring that there are no leaks and that all hardware is working properly.

Insure that you have fresh wash water available for personal emergency use.

Maintain accurate records of all MAGNACIDE® H Herbicide applications including:

1. Date
2. Time application started and stopped
3. Location
4. Flow of canal (cfs)
5. Water temperature
6. Orifice size and pressure setting
7. Parts per million concentration of MAGNACIDE® H Herbicide
8. Amount of MAGNACIDE® H Herbicide injected
9. Any additional information required by your state Department of Agriculture.

B. Application Instructions

Refer to Figure 1, MAGNACIDE® H Application Set Up, and Figure 2, MAGNACIDE® H Application Kit.

1. Calculate proper orifice size and regulator pressure setting using the appropriate tables shown in Section VI, Directions for Use.

2. Install orifice in orifice assembly (18). Make sure the screen filter is clean and in place. Wrap threads on orifice assembly (both cap and hose ends) with two layers of Teflon® tape to insure that a good seal is obtained. Wrap the threaded portions (14) of the nitrogen (blue) (A) and MAGNACIDE® H Herbicide (orange) (B) assemblies with two layers of Teflon® tape to insure that a good seal is obtained.

3. Secure nitrogen tank to prevent it from falling over. Do not lay tank down on its side. Connect nitrogen regulator (1) to nitrogen tank. Connect nitrogen hose (5) to tee (4).

   Note: It is necessary to examine the integrity of the nitrogen check valve and excess flow valve each time a new cylinder of nitrogen is used.

4. To check excess flow valve:
   Ensure nitrogen tank valve (F) is shut off and nitrogen pressure handle (G) is closed (counterclockwise). Remove check valve and attachments. Excess flow valve should remain attached to the regulator. Open nitrogen regulator pressure handle fully clockwise. Open nitrogen tank valve. Excess flow valve should activate to prevent unrestricted flow of nitrogen. Repair or replace if necessary. Close nitrogen tank valve (F) and nitrogen pressure handle (G).

5. To check integrity of check valve:
   Reinsert check valve only – backwards (arrow pointing toward regulator). Open nitrogen tank valve (F). Turn nitrogen regulator pressure handle (G) clockwise to open, to approximately 10 psi. Listen and

check with finger to see if any nitrogen is escaping through the check valve. Repair or replace if necessary. Close nitrogen tank valve (F) and nitrogen pressure handle (G). Reverse check valve, retape and reassemble nitrogen regulator system in original configuration.

6. Check MAGNACIDE® H cylinder/skid valves, nitrogen intake valve (blue) (C) and MAGNACIDE® H discharge valve (orange) (D) to insure that they are in the closed and secured position. Inspect purging assembly ball valve (blue) (11) and pressure bleed off valve (6) to insure each is closed.

   Note: Put on gloves, respirator and have wash water available before proceeding to Step 7.

7. Remove the plugs from the nitrogen intake (blue) (C) and MAGNACIDE® H Herbicide discharge (orange) (D) valves. Remove any Teflon® tape that may be in the valves. This tape could restrict flow of MAGNACIDE® H Herbicide and the desired application rate would not be obtained. Connect the nitrogen assembly (blue) (A) assembly to the nitrogen intake valve (blue) (C) and MAGNACIDE® H Herbicide assembly (orange) (B) to the MAGNACIDE® H Herbicide discharge valve (orange) (D).

8. Connect MAGNACIDE® H Herbicide injection hose (21) to the MAGNACIDE® H Herbicide assembly at the orifice outlet (19). A weight must be attached to the end of the injection hose (22) to insure that the hose remains submerged. Drop the weighted end of the injection hose into the canal at a point where MAGNACIDE® H Herbicide will mix thoroughly.

9. Connect nitrogen hose (5) to the nitrogen assembly (blue) (A) on the cylinder/skid.

10. In order to pressure test the application system for leaks, slowly open the nitrogen tank valve (F). Adjust regulator (G) to 30 psi. Check for leaks on nitrogen assembly, using soap solution. Retighten connections if necessary. Close nitrogen tank valve (F) and open bleed valve (blue) (6) to relieve nitrogen pressure.

11. Disconnect nitrogen hose at quick coupler (8) on nitrogen assembly (A). Reconnect nitrogen quick coupler (8) to the blue purge valve (9) on orange MAGNACIDE® H Herbicide assembly. Slowly open the nitrogen tank valve (F) and adjust regulator (G) to 30 psi. Open handle on purge valve (11). Check for leaks using soap solution. Retighten connections if necessary. Close nitrogen tank valve (F) and open bleed valve (6) to relieve nitrogen pressure. Reconnect nitrogen line (5) to nitrogen assembly (blue) (A) on the cylinder/skid.

12. Open blue nitrogen intake valve (C) on cylinder/skid slowly. Read cylinder/skid low pressure regulator gauge (7). If reading is greater than desired pressure setting for application (Step 1), the excess pressure must be bled off. Connect the MAGNACIDE® H Herbicide injection hose (21) to the pressure bleed off valve (blue) (6). Bleed the cylinder/skid pressure down below the desired application pressure. After bleeding down, the hose can be purged with nitrogen by closing the cylinder/skid blue nitrogen intake valve (C), opening the nitrogen tank valve (F) and opening the nitrogen pressure handle for 30 seconds. Close the pressure bleed off valve (6) and remove the MAGNACIDE® H Herbicide injection hose (21). Reconnect hose to MAGNACIDE® H Herbicide assembly (orange) (B).

13. Open nitrogen tank valve (F) and set pressure using the nitrogen regulator pressure handle (G) as calculated in Step 1, using pressure bleed off valve (6) as necessary. Check for leaks.

14. Open cylinder/skid blue nitrogen valve (C) slowly. The cylinder/skid will pressurize with nitrogen to the desired setting. Check for leaks.

15. Open orange MAGNACIDE® H Herbicide cylinder/skid discharge valve (D) slowly. You should observe MAGNACIDE® H Herbicide flowing through the injection hose.

16. Check for leaks on the MAGNACIDE® H Herbicide assembly (orange) (B) and injection hose (21). If a leak is detected, close the orange MAGNACIDE® H Herbicide discharge valve (D). If necessary, rinse with water. In most cases, the leak can be repaired by tightening the threaded connections on the

orange MAGNACIDE® H Herbicide assembly and hose.

Note: The orange MAGNACIDE® H Herbicide assembly and injection hose may need to be disassembled and retaped with Teflon® tape to repair the leak. Follow shutdown steps 6, 7, 8, 9 and 20 – 26 to purge MAGNACIDE® H Herbicide from assembly and hose before disassembly of injection equipment.

Repair leak and follow application Steps 7 - 16.

Be sure pressure is readjusted to desired application pressure as determined in Step 1.

17. Make note of time that application began to determine duration of application. Complete application record.

18. Periodically during application check MAGNACIDE® H Herbicide application equipment to insure that equipment is functioning properly. Goggles are to be worn during visual checks.

19. Monitor the nitrogen usage such that the remaining pressure in the nitrogen cylinder never drops below 100 psi during the application. This, in addition to the check valve, will prevent any backflow of MAGNACIDE® H Herbicide vapors into the nitrogen cylinder.

C. Shutdown Procedure

Note: Put on respirator and gloves and have wash water available before proceeding to Step 20.

20. Close orange MAGNACIDE® H Herbicide cylinder/skid discharge valve (D) slowly.

21. Close blue cylinder/skid nitrogen intake valve (C) slowly and secure the valve handle.

22. Remove nitrogen hose from nitrogen assembly (blue) (A).

23. Connect nitrogen hose female quick coupler (8) to the blue purge valve (9) on orange MAGNACIDE® H Herbicide assembly (B). Adjust pressure with the nitrogen regulator pressure handle (G) 10 psi higher than the previously set application pressure. Open handle on purge valve (11). Nitrogen will immediately flow through the application hose and bubbles will be seen in the canal. Let nitrogen flow for at least 60 seconds to purge all MAGNACIDE® H Herbicide out of injection hose. Check any coils for remaining chemical.

24. Open and close orange MAGNACIDE® H Herbicide discharge valve (D) several times to force all MAGNACIDE® H Herbicide in chemical assembly and valve back into container.

25. Close orange MAGNACIDE® H Herbicide discharge valve (D) and secure. Close purge valve (11).

26. Remove nitrogen hose female quick coupler (8) from purge valve (9).

27. Close nitrogen tank valve (F).

28. Bleed pressure from nitrogen line with pressure bleed off valve (6) on regulator.

29. Disconnect nitrogen regulator (1) from nitrogen tank. Wrap regulator in a protective covering to prevent damage.

30. Replace nitrogen tank valve stem cover.

31. Remove nitrogen assembly (blue) (A) from cylinder/skid nitrogen intake valve (C) and install valve plug.

32. Disconnect injection hose (21) from the orange MAGNACIDE® H Herbicide assembly (B).

33. Remove orange MAGNACIDE® H Herbicide assembly from cylinder/skid valve (D) and install valve plug.

34. Secure cylinder/skid bonnet lid.

35. Wash assemblies and application hose with fresh water to remove any remaining traces of MAGNACIDE® H in order to prevent any inadvertent exposure to acrolein vapors.

36. Remove respirator and gloves.

37. Store all equipment properly. Store all personal protective equipment separately from application equipment to prevent contamination.

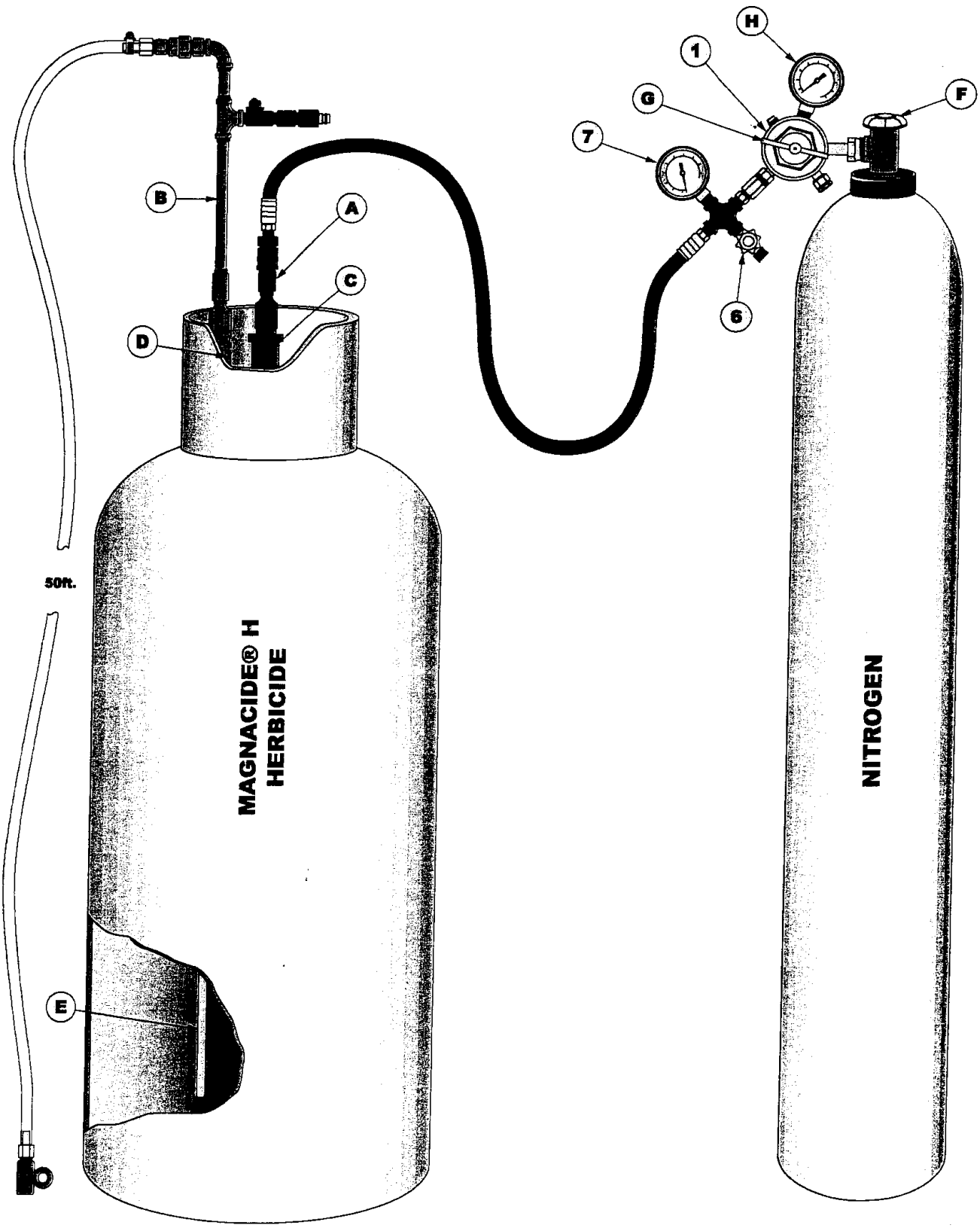
VIII. MAGNACIDE® H APPLICATION SET UP INDEX (for use with Figure 1, MAGNACIDE® H Application Set Up)

A. Nitrogen assembly (blue)
B. MAGNACIDE® H Herbicide assembly (orange)
C. MAGNACIDE® H Herbicide cylinder nitrogen intake valve
D. MAGNACIDE® H Herbicide cylinder discharge valve
E. MAGNACIDE® H Herbicide dip tube (delivers chemical from bottom of cylinder to assembly B)
F. Nitrogen tank valve
G. Nitrogen regulator pressure handle
H. Nitrogen tank high pressure (psi) gauge

1. Nitrogen regulator with high pressure gauge
6. Pressure bleed off valve (blue)
7. Low pressure nitrogen gauge

Figure 1.

MAGNACIDE® H APPLICATION SET UP

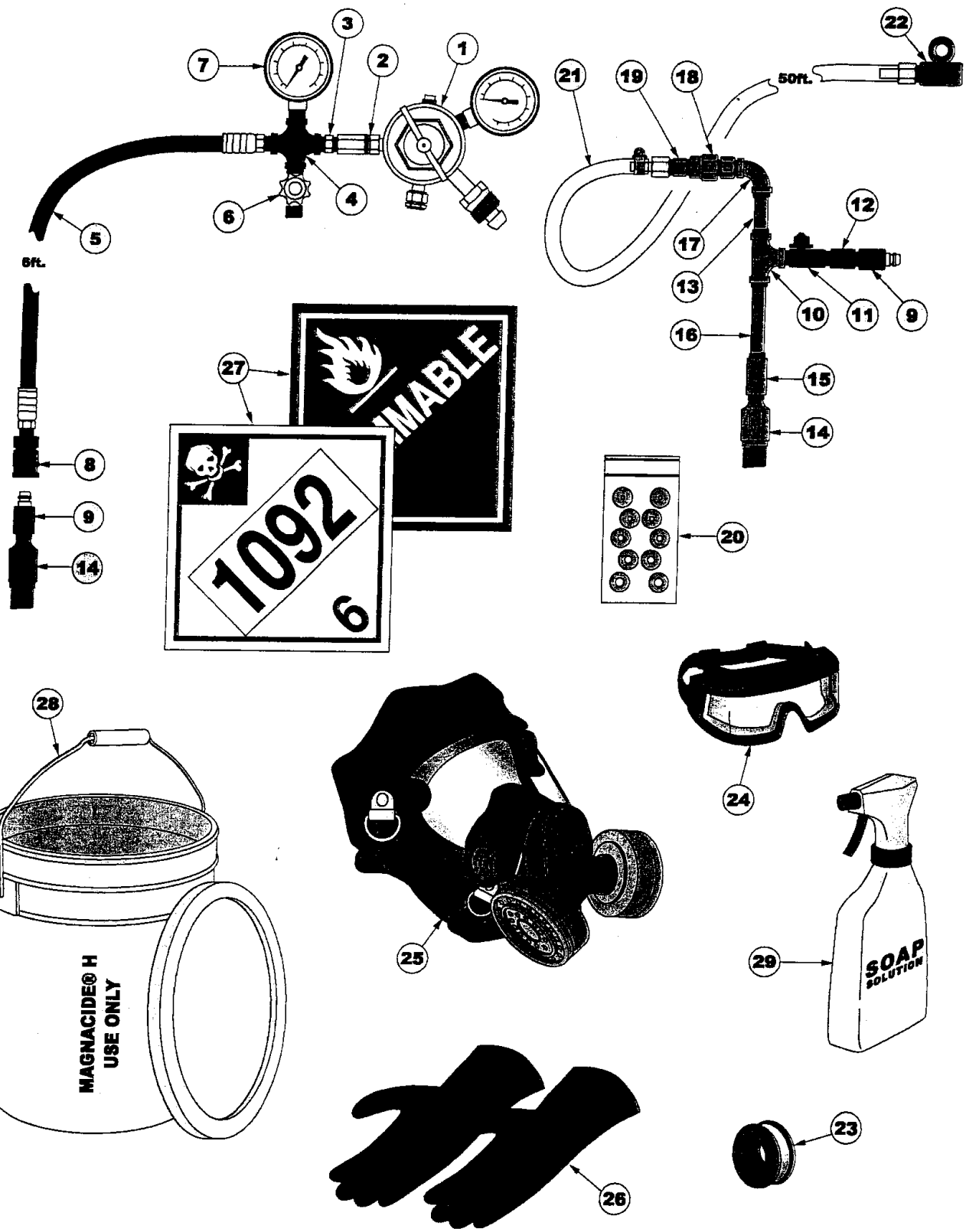


IX. MAGNACIDE® H APPLICATION KIT INDEX
(for use with Figure 2, MAGNACIDE® H Application Kit)

1. Nitrogen regulator with high pressure gauge
2. Excess flow valve
3. Check valve
4. Tee
5. Nitrogen hose
6. Pressure bleed off valve
7. Low pressure nitrogen gauge
8. Nitrogen hose female quick coupler
9, 14. Nitrogen assembly (A)
9 - 19. MAGNACIDE® H Herbicide assembly
18 - 19. Orifice assembly with screen filter
20. One set of orifice plates
21. 50' MAGNACIDE® H Herbicide injection hose
22. Hose end for attaching weight
23. Teflon tape
24. Goggles
25. Respirator
26. Butyl rubber gloves
27. Placards (8 total – 1092 and flammable)
28. Plastic 6-gallon bucket with lid
29. Soap solution

Figure 2.

MAGNACIDE® H APPLICATION KIT



X. EQUIPMENT AND HARDWARE

All hardware used in a MAGNACIDE® H Herbicide system must be chemically compatible. This means that the materials used in the system must not cause a reaction with the MAGNACIDE® H Herbicide or be dissolved or deteriorated by it. If the materials are not compatible, either the materials will be degraded or the MAGNACIDE® H Herbicide will itself degrade, resulting in a polymerization reaction. A polymerization reaction will release heat and pressure and could rupture the container, causing possible damage to personnel or property.

All parts used in the MAGNACIDE® H Herbicide Application Kit have been thoroughly tested for their compatibility with our product. No substitutions should be made without authorization from Baker Petrolite Crop Protection Chemicals.

In addition, all equipment and hardware must be free from all traces of contaminants, especially alkalies (such as ammonia and caustics) and acids. Contamination of MAGNACIDE® H Herbicide with these substances can cause vessels, piping and other hardware to rupture.

XI. TRANSPORTING MAGNACIDE® H Herbicide CONTAINERS

Transportation of hazardous chemicals is regulated by the U. S. Department of Transportation (DOT). The DOT requirements for transporting MAGNACIDE® H Herbicide (acrolein, inhibited) are as follows:

1. Transporting vehicle must be placarded when hauling full, partial or empty containers. Required placards are Inhalation Hazard 1092 and Flammable Liquid, available at cost through Baker Petrolite Corporation. All four sides of the transporting vehicle must have placards displayed. with the 1092 placards (primary hazard) in left or upper position.

2. Driver must carry correct shipping papers at all times. These must include the correctly worded bill-of-lading supplied by Baker Petrolite Corporation or commercial freight line, material safety data sheet for MAGNACIDE® H Herbicide, and Chemtrec emergency response information (supplied with bill-of-lading).

3. Special drivers license requirements are in effect for transporting hazardous materials. For details, contact the Department of Motor Vehicles in your state.

Bills-of-lading for transportation of empty containers are available from your Baker Petrolite Crop Protection Chemicals representative or Baker Petrolite Corporation's Taft, CA office.

XII. RETURN OF EMPTY MAGNACIDE® H Herbicide CONTAINERS

Empty containers are to be returned, freight collect, to:

Baker Petrolite Corporation
19815 S. Lake Rd.
Taft, CA 93268

Please Note: No partly used containers should be returned to Baker Petrolite Corporation without prior notification. For information concerning the return of partly used containers, contact:

Baker Petrolite Corporation
Telephone: (661) 763-5137
E-mail address: cropprotectionchemicals@bakerpetrolite.com

Normally, no credit will be issued for unused material returned from opened cylinders or skid tanks.

A. Preparation for Shipment of Empty Containers

Prepare empty containers for shipment as follows:

1. Relieve container pressure down to 15-25 psig. This is normally accomplished by venting into the irrigation system during treatment.
2. Replace plugs in the inlet and outlet valves and tighten securely.
3. Fasten down valve handles securely.
4. Close lid and secure with latch.
5. Containers must be transported upright. Alert the carrier to secure containers to prevent overturning during transport.

The DOT has special shipping paper requirements for shipment of empty containers which previously contained a hazardous material. Properly worded bills-of-lading for empty containers are available through your technical sales representative or Baker Petrolite Corporation's Taft, CA office. Trucks transporting empty containers must be placarded. It is the responsibility of the shipper to provide necessary placards.

XIII. DISCLAIMER

This document is intended to serve as general information for companies to review and use in implementing their MAGNACIDE® H Herbicide application and safety programs. The information contained herein has been compiled from a number of sources, including information readily available to the public. Although every effort has been made to provide complete and accurate information, Baker Petrolite Corporation cannot accept responsibility, nor shall it be liable, for any inaccuracies of public information sources, misinterpretations or incomplete information which may be contained in this document.

APPENDIX A

Water Measurement Equivalents

Discharge or Rate of Flow	The volume of water that passes a particular reference section in a unit of time. Usually designated as cubic feet per second or miner's inches.
1 cfs	1 cubic foot per second (mean depth (ft) x mean width (ft) x linear velocity (ft/sec)).
Miner's Inch	The quantity of water which will flow through an orifice one inch square under a stated head which varies from 4 to 6 1/2 inches in different localities.
Acre Foot	A commonly employed unit of volume defined as that quantity of water required to cover one acre of land to a depth of one foot or 43,560 cubic feet.
1 cfs	450 gallons per minute
1 cfs	50 miner's inches in Idaho, Kansas, Nebraska, New Mexico, North Dakota, South Dakota, Northern California, Washington and Utah.
1 cfs	40 miner's inches in Arizona, Southern California, Montana and Oregon.
1 cfs	38.4 miner's inches in Colorado.
1 cfs Flowing 1 Hour	1 acre inch.
1 cfs in 12 Hours	1 acre foot.
1 cu. ft. of Water at 25°C	62.2 lb., 7.48 gallons.
1 Gallon Water	8.34 lb.
1 Acre Foot of Water	2.7 million lb.
2.7 lb. Product/Acre Ft.	1 ppm MAGNACIDE® H Herbicide.
1 lb. Product/Million Gallons	0.12 ppm MAGNACIDE® H Herbicide.
1 Acre	43,560 sq. ft., 1/640 square mile.
1 Mile	5,280 feet; 1,760 yards.
1 Kilometer	0.62 miles.
1 Inch	2.54 cm = 25.4 mm.
1 Ounce	28.35 grams.
1 Gram	0.0353 ounces.
1 lb.	453.59 grams.
1 Fluid Ounce	29.57 ml.
1 Pint	473.2 ml.
1 Gallon (U. S.)	0.823 gallon (British)
1 mph	88 ft/min = 1.5 ft/sec.
m^3	264.2 gallons
1.6 kilometers	1 mile
1 m^3/sec.	35.3 cubic ft/sec.
1 hectare	2.47 acres
3.79 liters	1 gallon
2.2046 lbs.	1 kilogram
2.2 mega liters/day	1 cubic foot per second/24 hours

APPENDIX B

MAGNACIDE® H Herbicide Monitor

The MAGNACIDE® H Herbicide monitor is a hand held colorimeter designed to quickly and easily determine the concentration of MAGNACIDE® H Herbicide in irrigation waters. The instrument's compact size and easy operating procedures make it a handy tool for measuring MAGNACIDE® H Herbicide levels in even the most remote irrigation channels.

A simple test determines the parts per million (ppm) of chemical present in the treated water with an accuracy of 0.1 ppm. The monitor readily measures the concentration of MAGNACIDE® H Herbicide in the range of 0.25 to 15.0 ppm. Test results are read directly off the monitor's scale, thus eliminating the need for complicated calculations.

The MAGNACIDE® H Herbicide monitor is furnished in a kit with all necessary equipment to conduct a number of tests. For additional information on the MAGNACIDE® H Herbicide monitor, please contact your technical sales representative.

APPENDIX C

Toxicity

Results of toxicological studies are summarized below:

The acute oral toxicity (LD_{50}) of MAGNACIDE® H Herbicide for rats is approximately 29 mg/kg. The acute dermal LD_{50} of undiluted MAGNACIDE® H Herbicide in rabbits is 231.4 mg/kg.

In a subacute study conducted with male and female rats for 90 days, MAGNACIDE® H Herbicide was added to the drinking water at 0, 5, 13, 32, 80, and 200 ppm. Growth of both sexes was equal or better than the controls. Food efficiency was equivalent to the controls at all levels. Water consumption was reduced by 1/3 at the 200 ppm level for the first 3 weeks, but by the 12th week the animals had apparently adapted to the odor and taste of the MAGNACIDE® H Herbicide in the drinking water. There were no hematological, organ weight or pathological changes that could be attributed to the ingestion of the drinking water containing the MAGNACIDE® H Herbicide.

In a study of skin absorption, rabbits were immersed, except for the head, for one hour in 20 or 100 ppm aqueous solutions of MAGNACIDE® H Herbicide. There was no adverse effect at 20 ppm. At 100 ppm, one rabbit appeared weakened, but returned to normal in 24 hours.

Lactating dairy cows were given MAGNACIDE® H Herbicide in their drinking water at levels of 30, 60, or 90 ppm for 24 hours. There were no adverse effects at 30 and 60 ppm on body weight, water intake, feed and water consumption, and milk and butterfat production. No off-flavor was imparted to the milk. At 90 ppm, the only noticeable effect was 1/4 - 1/3 drop in water and hay consumption with a transitory drop in weight. However, all factors measured returned to normal the following day.

Data on vapor toxicity show that MAGNACIDE® H Herbicide vapor exerts its main action on the eyes and mucous membranes of the respiratory tract; severe exposure may produce serious injury to the lungs. A table of sensory response values is given below.

Atmospheric Concentration (ppm)	Duration of Exposure	Probable Human Response
0.25	5 minutes	Moderate irritation
1.0	5 minutes	Painful irritation
1.0	2 - 3 minutes	Eye and nose irritation
5.5	20 seconds	Painful eye and nose irritation
5.5	1 minute	Practically intolerable
153.0	10 minutes	May be fatal

The odor threshold for acrolein will vary among humans, depending upon the olfactory sensitivity and acuteness. Detection threshold will vary between 0.02 and 1.8 ppm[1].

[1]Carson, B. L., Beall, C. M., Ellis, H. V., Baker, L. H. and Herndon, B. L., Acrolein Health Effects. U. S. Environmental Protection Agency (US EPA), EPA-460/3-81-034, NTIS PB82-161282, 1-121, September 1981.

RESTRICTED USE PESTICIDE
DUE TO A HIGH ACUTE TOXICITY
For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.

BAKER HUGHES

Baker Petrolite

MAGNACIDE® H HERBICIDE
(Acrolein, Inhibited)

CONTENTS UNDER PRESSURE

EPA Reg. No. 10707-9 EPA Est. 10707-CA-005

ACTIVE INGREDIENT	BY WEIGHT
Acrolein	95%
INERT INGREDIENTS	5%
TOTAL	100%

This product contains the toxic inert ingredient hydroquinone.
(MAGNACIDE® H Herbicide contains 6.7 pounds of active ingredient per gallon.)

DANGER POISON

KEEP OUT OF REACH OF CHILDREN

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

EXTREMELY FLAMMABLE AND IRRITATING VAPOR AND LIQUID. POISONOUS BY INHALATION. SKIN CONTACT OR SWALLOWING. DO NOT BREATHE VAPOR. CORROSIVE. CAUSES EYE AND SKIN DAMAGE. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. KEEP AWAY FROM FIRE, SPARKS AND HEATED SURFACES.

When setting up and breaking down application equipment, a full-face air purifying respirator with organic vapor (OV) cartridges jointly approved by the Mine Safety and Health Administration (MSHA) and the National Institute of Occupational Safety and Health (NIOSH) and butyl rubber gloves must be worn. For visual inspection during treatment, chemical splash goggles must be worn. If spilled on clothing, gloves, or shoes, remove them immediately and wash thoroughly with soap and water before reuse. Use with adequate ventilation.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Keep out of lakes, streams or ponds. Fish, shrimp and crabs will be killed at application rates recommended. Do not apply where they are important resources. Do not apply to water drainage areas where runoff or flooding will contaminate ponds, lakes, streams, tidal marshes and estuaries. Do not contaminate water by cleaning of equipment or disposal of wastes. Notify your State Fish and Game Agency before applying this product. Use only as specified.

PHYSICAL AND CHEMICAL HAZARDS

DANGER: Extremely flammable. Contents under pressure. Keep away from fire, sparks and heated surfaces. Do not puncture or incinerate container. Acrolein, the active ingredient in MAGNACIDE® H Herbicide, is highly reactive chemically and readily forms polymers. If alkalies (such as ammonia and caustic) or strong acids are brought in contact with MAGNACIDE® H Herbicide in a closed system, the Herbicide can polymerize with sufficient violence to rupture the container. Do not apply with equipment used for acids and alkalies. Contamination of MAGNACIDE® H Herbicide with any foreign matter must be avoided.

A supply of sodium carbonate (soda ash) should be readily available for deactivating spilled MAGNACIDE® H Herbicide. All spills should be confined and deactivated before disposal. See the MAGNACIDE® H Herbicide Application and Safety Manual for additional information.

FIRST AID

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.

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 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

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

Have the product container, label or application manual with you when calling a poison control center or doctor, or going for treatment. CALL A PHYSICIAN IMMEDIATELY IN ALL CASES OF SUSPECTED POISONING.

NOTE TO PHYSICIAN

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

WARNING SIGNS AND SYMPTOMS: Liquid MAGNACIDE® H Herbicide is absorbed by the skin and is particularly irritating to any lesion and to the eye. The vapors act principally on the mucous membrane of the eyes and respiratory tract. Because of the extreme lachrymatory warning effect, the concentration tolerable by man is far below the minimum lethal concentration.

TREATMENT: Treat exposed area as a chemical burn. Thoroughly flush eyes with water and treat symptomatically. Persons exposed to MAGNACIDE® H Herbicide vapors have a delayed reaction and experience irritation of the respiratory tract. In severe cases, this may progress to pulmonary edema. Therefore, it is advisable to keep persons exposed to MAGNACIDE® H Herbicide under observation for 24 hours following exposure.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
MAGNACIDE® H Herbicide is a water soluble material for the control of submersed and floating weeds and algae in irrigation canals. This material must be applied in accordance with directions in the MAGNACIDE® H Herbicide Application and Safety Manual by a certified applicator or under a certified applicator's supervision. Do not permit dairy animals to drink treated water. Do not use where waters will flow into potential sources of drinking water. Water treated with MAGNACIDE® H Herbicide must be used for irrigation of fields, either crop bearing, fallow or pasture, where the treated water remains on the field OR held for 6 days before being released into fish bearing waters or where it will drain into them.

STORAGE AND DISPOSAL
STORAGE OF MAGNACIDE® H HERBICIDE TANKS

All containers of MAGNACIDE® H Herbicide should be stored in a secured, well-ventilated area, away from all other chemicals. No alkalies or oxidizing materials should be near. Any electrical equipment should be Class 1 - Division 2 and properly grounded. Do not reuse empty container. Return empty containers to Baker Petrolite Corporation.

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.

NOTICE OF WARRANTY

BAKER PETROLITE CORPORATION MAKES NO WARRANTY OF MERCHANTABILITY FITNESS FOR ANY PURPOSE, OR OTHERWISE, EXPRESSED OR IMPLIED concerning this product or its uses which extend beyond the use of the product under normal conditions in accord with the statements made on this label.

NET WEIGHTS

Cylinder-370 lbs. Skid Tank-2450 lbs.

Acrolein, Inhibited, 6.1, (3), UN 1092, PG I, Toxic-Inhalation Hazard, Zone A, Marine Pollutant, RQ

RC 0601

MANUFACTURED BY: BAKER PETROLITE CORPORATION 12645 W. Airport Blvd., Sugar Land, TX 77478 Customer Care: 800-872-1916

Appendix B

Application Log Sheet

FIELD DATA COLLECTION FORM

Site ID:_____ Date:_____ Collected By:_____

Site Location (circle): at application point upstream downstream Station Type (circle): refrence treated

Wind (circle): low high Water Color (circle): clear green green-brown brown other

Herbicide:_____ Gallons Applied:_____ Application Time (start/finish):_____/_____

FIELD MEASUREMENTS

Water Depth	pH	Dissolved Oxygen	Water Temp	Conductivity	Meter Used
(meters)		(mg/L)	°C	µS/cm	

SAMPLES COLLECTED

Sample ID	Time	Sample Depth	Notes

Additional Notes or Comments:_____

Wildlife presence:_____