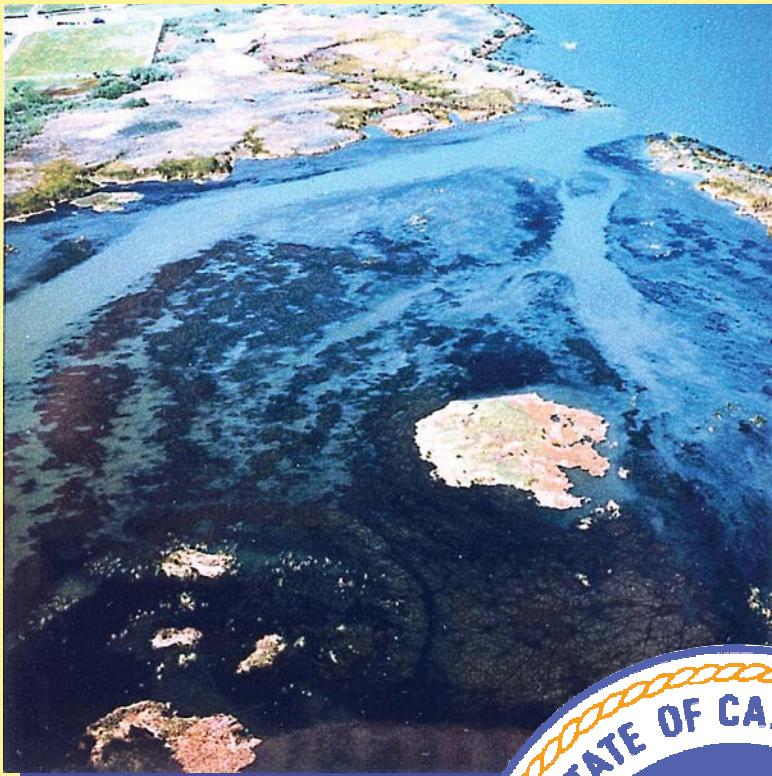
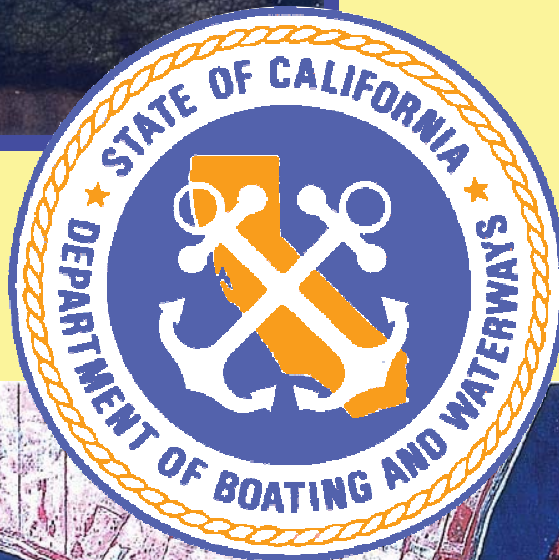


Egeria densa Control Program

*Addendum to 2001
Environmental
Impact Report*



February 2003

**Addendum to
2001 *Egeria densa*
Control Program
Environmental Impact Report**

**Prepared by
The California Department of
Boating and Waterways**

February 2003

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Section 1.0

Introduction

1.0 Introduction

The Department of Boating and Waterways (DBW) prepared this addendum to the 2001 *Egeria densa* Control Program Environmental Impact Report (EDCP EIR) to incorporate the use of a new aquatic herbicide, Sonar Precision Release, into the EDCP. The EDCP is a control program for the aquatic weed *Egeria densa* in the Sacramento-San Joaquin Delta (Delta). This addendum includes an overview of Sonar Precision Release, its use in the EDCP, and discusses to what degree Sonar Precision Release use will have the potential for new environmental impacts on the Delta.

A total of four sections follow this introductory section:

- 2.0 *Project Description*
- 3.0 *Environmental Setting*
- 4.0 *Analysis of Sonar Precision Release*
- 5.0 *Conclusions.*

There are a total of eight (8) appendices to this addendum.

1.1 Environmental Impact Report Background

In the following subsections, the background and timing of the EDCP EIR is provided.

1.1.1 *Notice of Preparation*

DBW issued a Notice of Preparation for a draft EDCP EIR on November 11, 1998. The Notice of Preparation was sent to the State Clearinghouse in the State of California Office of Planning and Research.

1.1.2 *Draft Environmental Impact Report*

DBW submitted the draft EDCP EIR in March 2000 to the State Clearinghouse. The draft EDCP EIR was released at that time for a 45-day public review and comment period between April 10, 2000 and May 24, 2000. The State Clearinghouse circulated the draft EDCP EIR to 14 regulatory agencies and departments. Other organizations also received copies of the draft EDCP EIR directly from DBW. DBW made five public presentations in April 2000 to various stakeholders to review the draft EDCP EIR.

1.1.3 *Final Environmental Impact Report*

DBW received comments from 19 entities on the draft EDCP EIR by late 2000. DBW prepared responses to comments and distributed them to the various entities. The final EDCP EIR was completed on March 2001 and includes the following four volumes:

- Volume I – Draft EDCP EIR
- Volume II – Research Trial Reports
- Volume III – Response to Comments
- Volume IV – Findings of Fact and Statement of Overriding Considerations.

This four volume document (hereafter referred to as the 2001 EDCP EIR) is available under separate cover and is located on the web at <http://dbw.ca.gov/PDF/EIR/eir.pdf>. A complete administrative record of the EIR process is located at DBW offices at 2000 Evergreen Street, Suite 100, Sacramento, California, 95815.

1.1.4 Certification

DBW, as the lead agency, read and considered the information contained in the 2001 EDCP EIR. Mr. Carl Moore, Interim DBW Director, certified the 2001 EDCP EIR on March 2, 2001. DBW filed a Notice of Determination with the State of California Office of Planning and Research on March 2, 2001.

1.2 CEQA Guidelines for Addendum

CEQA Guidelines identify the decision making process DBW should use to determine the type of CEQA document appropriate for this modification to the EDCP (§15164(a) and §15162). CEQA Guidelines (§15164(a)) specify that the lead agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary, but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred. According to Section 15162, a subsequent EIR **shall not** be prepared for this project unless DBW determines, based on substantial evidence in light of the whole record, one or more of the following:

- Substantial changes are proposed to the EDCP which will require major revisions to the 2001 EDCP EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects
- Substantial changes occur with respect to the circumstances under which the EDCP is undertaken which will require major revisions to the 2001 EDCP EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
- New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the 2001 EDCP EIR was certified as complete, shows any of the following:
 - ♦ The EDCP will have one or more significant effects not discussed in the 2001 EDCP EIR
 - ♦ Significant effects previously examined in the 2001 EDCP EIR will be substantially more severe than shown in the 2001 EDCP EIR

- Mitigation measures or project alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects on the environment, but DBW declined to adopt the mitigation measure or alternative; or
- Mitigation measures or project alternatives which are considerably different from those analyzed in the 2001 EDCP EIR would substantially reduce one or more significant effects on the environment, but DBW declined to adopt the mitigation measure or alternative.

Additionally, should DBW determine that one or more of the conditions noted above apply; DBW may also elect to prepare a supplemental EIR. Specifically, CEQA Guidelines, Section 15163, specifies that the lead agency shall prepare a supplemental EIR rather than a subsequent EIR if:

- Any of the conditions described in Section 15162 above would require the preparation of a subsequent EIR, and
- Only minor additions or changes would be necessary to make the previous EIR adequately apply to the EDCP in the changed situation.



Section 2.0

Project Description

2.0 Project Description

The EDCP is a program for controlling the nuisance aquatic weed *Egeria densa* in the Sacramento-San Joaquin Delta (Delta). DBW is the lead agency for this program. Existing EDCP treatment methods available for DBW to use include:

- ❑ Reward (active ingredient diquat dibromide, EPA Registration No. 10182-404)
- ❑ Sonar, including two formulations –
 - Sonar A.S. (liquid formulation of fluridone, EPA Registration No. 67690-4)
 - Sonar Slow Release Pellet, or Sonar SRP (granular formulation of fluridone, EPA Registration No. 67690-3)
- ❑ Mechanical harvesting.

Based on the level of *Egeria densa* infestation and the importance to navigation of selected Delta waterways, a total of 35 priority sites were identified for treatment over the five-year EDCP, which began in 2001. Specific treatment methods were identified in the EIR for each of the 35 sites.

The change to the 2001 EDCP EIR described in this addendum is the addition of a new aquatic herbicide, Sonar Precision Release, to the EDCP. Sonar Precision Release is a registered aquatic herbicide (EPA Registration Number 67690-12) for use on *Egeria densa*. The purpose of this addendum is to evaluate the potential impacts of adding this new control method to the EDCP.

At the time the 2001 EDCP EIR was prepared, Sonar Precision Release was unavailable as a treatment method for the EDCP. The two Sonar formulations (Sonar AS and Sonar SRP) were not well suited for flowing water conditions. Thus, DBW selected these two Sonar formulations for ten (10) lower flow or less tidally influenced treatment sites.

With its availability in 2001, DBW intends to substitute Sonar Precision Release for the EDCP in the three ways described in this section (Sections 2.1-2.3). DBW does not intend to use Sonar Precision Release on any new sites beyond the original list of 35 priority sites identified in the EIR. For reference, the original list of 35 priority sites is provided in Exhibit 1-6 of the 2001 EDCP EIR.

2.1 Treating Sonar AS and Sonar SRP Sites with Sonar Precision Release

DBW intends to incorporate Sonar Precision Release into the EDCP as a management option to replace Sonar AS or Sonar SRP for the following six (6) sites identified in the 2001 EDCP EIR:

No.	Site Number	Site Name	Original Control Method in 2001 EIR	Acreage
1	#4	Sherman Island	Sonar AS, yrs. 3-5	23
2	#13	Old River Del's	Sonar AS	23
3	#17	14 Mile Slough	Sonar SRP	52
4	#21	Big Break Wetlands	Sonar AS	55
5	#22	Big Break II	Sonar AS	3
6	#29	Pixley Slough	Sonar SRP	27
Total				183

2.2 Treating Reward (Diquat) Sites with Either Sonar Precision Release or Reward (Diquat)

DBW intends to incorporate Sonar Precision Release into the EDCP as a management option to substitute for Reward (Diquat) at any of the following 25 sites originally specified as Reward (Diquat) sites in the 2001 EDCP EIR.

No.	Site Number	Site Name	Acreage
1	#3	Big Break I (yrs. 3-5)	23
2	#5	Rock Slough	37
3	#7	Fisherman's Cut	21
4	#9	Sandmound Slough	38
5	#10	Pipers Slough	19
6	#11	Lathum Slough	104
7	#12	Disappointment Slough (yrs. 3-5)	76
8	#14	Old River Connection	37
9	#15	Middle River Bullfrog	57
10	#16	Middle River Jones	38
11	#18	Middle River Victoria	20
12	#19	Donlon Island	12
13	#20	Rhode Island	88
14	#23	Seven Mile Slough	23
15	#24	Dutch Slough	63
16	#25	Little Potato Slough	30
17	#26	Turner Empire Cut	17
18	#27	Little Venice Island	12
19	#28	Coney Island	12
20	#29	Hog Island	12
21	#31	Bacon Island	30
22	#32	Paradise Cut	18
23	#33	Bishop Telephone Cut	7
24	#34	Old River Orwood	90
25	#35	Potato Slough	48
Total			932

For these 25 sites, based on the conditions at that site, DBW would select either Reward (Diquat) or Sonar Precision Release to use at a site in a given treatment season. Thus, for a given treatment season, there is the potential that DBW would use Sonar Precision Release for all 25 sites, or 932 acres, that were previously identified as Reward (Diquat) sites. However, a complete reliance on Sonar Precision Release is highly unlikely given that either Reward (Diquat) or Sonar Precision Release may be better suited for a given treatment site based on DBW's pre-treatment evaluation and the site conditions at the time of treatment.

2.3 Performing Sequential Reward (Diquat) and Sonar Precision Release Treatments

DBW intends to incorporate Sonar Precision Release into the EDCP as a management option to use sequentially in conjunction with the 25 Reward (Diquat) sites identified in subsection 2.2 above, and at the following four (4) sites identified as Reward (Diquat) and/or Sonar sites in the 2001 EDCP EIR:

No.	Site Number	Site Name	Original Control Method(s) in 2001 EIR	Acreage
1	#1	Frank's Tract	Reward (Diquat)/Sonar SRP	158
2	#2	Venice Cut	Reward (Diquat)/Sonar AS	147
3	#6	White Slough	Reward (Diquat)/Sonar SRP/Mechanical Harvesting	129
4	#8	Taylor Slough.	Reward (Diquat)/Sonar SRP	13
Total				447

For a selected number of these 29 sites, DBW expects to treat a site twice a year, first with Reward (Diquat) and then second with Sonar Precision Release. The decision to sequentially treat with Reward (Diquat) and then Sonar Precision Release is a response to the later EDCP treatment start dates imposed by the various regulatory agencies. The original treatment period requested by DBW was April through November, but due to the potential presence of sensitive fish species, EDCP treatments are not allowed prior to June 1. By the time EDCP treatments begin, *Egeria densa* has reached the water surface and is not at the optimum growth stage for any type of Sonar use. An initial treatment with Reward (Diquat) can stimulate new plant stem growth, making a subsequent Sonar treatment more efficacious. Sonar is most effective when applied during the new growth stage of a plant because the plant manufactures a majority of its carotene during this early stage.

Based on the original intent of the EDCP as an adaptive management program, there are several references in the 2001 EDCP EIR that support advancing the EDCP as new methods or better information about these methods becomes available. These EIR references are described in **Appendix A**.

The manufacturer of Sonar, *SePro*, has provided some background and documentation on Sonar Precision Release. This *SePro* documentation is provided in **Appendix B**.



Section 3.0

Environmental Setting

3.0 Environmental Setting

The EDCP is located within the Sacramento-San Joaquin Delta (Delta). The Delta encompasses 738,000 acres, with hundreds of miles of waterways. A total of 19 rivers flow into the Delta. The Delta is bordered by the cities of Sacramento, Stockton, Tracy, and Pittsburg. The Delta includes the cities of Antioch, Brentwood, and Isleton, and about 14 unincorporated areas.

Of the 50,000 water body surface acres in the Delta, *Egeria densa* has infested approximately 3,900 of these acres (as of 1997). DBW intends to treat approximately 1,733 of these acres. Through this addendum, DBW is not proposing to change the number of acres it will treat as part of the EDCP. The baseline physical conditions in the Delta are described in detail in Chapter 2 of the 2001 EDCP EIR.



Section 4.0

Analysis of Sonar Precision Release

4.0 Analysis of Sonar Precision Release

In this section the impacts of the three Sonar Precision Release options described in the project description (Section 2.0) are evaluated.

4.1 Impacts of Treating Sonar AS and Sonar SRP Sites with Sonar Precision Release

DBW has determined that substitution of Sonar Precision Release for Sonar AS and Sonar SRP would not create new significant environmental effects. The primary reasons that there are no new environmental effects are that (1) Sonar Precision Release has a virtually identical label and Material Safety Data Sheet (MSDS) as Sonar SRP (labels and MSDSs are provided in **Appendix C** to this addendum) and (2) Sonar SRP already was approved in the 2001 EDCP EIR. The following comparisons between Sonar Precision Release and Sonar SRP support this determination:

- Sonar Precision Release has the same percent active ingredient as with Sonar SRP. Each contains 5 percent fluridone.
- Sonar Precision Release has the same percent inert ingredients as with Sonar SRP. Each contains 95 percent inerts.
- Labeled rates are the same for Sonar Precision Release and Sonar SRP, not to exceed a maximum of 150 ppb and recommended at rates to maintain a 10 ppb to 40 ppb concentration for a minimum of 40 days.
- Like Sonar SRP, Sonar Precision Release is registered for aquatic use and is labeled for *Egeria densa* control.

The United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and Central Valley Regional Water Quality Control Board (CVWQCB) all have implicitly accepted the use of Sonar Precision Release for the EDCP based on the fact that Sonar Precision Release's active ingredients and MSDSs show no material changes from those of the prior approved Sonar Slow Release Pellet herbicide.

The USFWS indicated in a May 3, 2002 letter to DBW that Sonar Precision Release has "the same effects as Sonar AS and Sonar SRP" (see **Appendix D** for a copy of this letter). Further, that "the level of incidental [fish] take that would occur from the use of Sonar Precision Release in place of Sonar AS and Sonar SRP would not exceed that which would occur from the original biological opinion," which was based on the 2001 EDCP EIR.

4.2 Impacts of Treating Reward (Diquat) Sites with Sonar Precision Release

In the case where DBW substitutes Sonar Precision Release for Diquat (Reward) at selected sites (Section 2.2 above), DBW has determined that the revised EDCP would have the potential to create less environmental effects. As an example, the overall impacts from short-term localized reductions in dissolved oxygen would be lower for Sonar Precision Release than for Reward (Diquat).

Based on conclusions previously stated in the 2001 EDCP EIR, in contrast to Reward (Diquat), Sonar Precision Release does not have the potential to:

- Decrease dissolved oxygen levels or violate Basin Plan standards regarding dissolved oxygen
- Decrease abundance of aquatic invertebrates in and around treatment sites
- Have direct impacts to fish exposed during or following treatments.

Regulatory agencies also support substitution of Sonar for Reward (Diquat). In a January 23, 2003 letter to DBW, the USFWS concluded that Sonar Precision Release pellets are less toxic than Reward (Diquat) (see **Appendix E**). Therefore “the level of incidental [fish] take that would occur from use of Sonar Precision Release pellets in place of Diquat would not exceed that which would occur from the original biological opinion.”

4.3 Impacts of Sequential Reward (Diquat) and Sonar Precision Release Treatments

DBW finds that the sequential treatments of Reward (Diquat) followed by Sonar Precision Release do not change the level of environmental impacts specified in the 2001 EDCP EIR. These unchanged EDCP environmental impacts are summarized in **Exhibit F-1** in **Appendix F**.

Were DBW to perform treatments with Reward and Sonar too closely together, there is the potential for these two chemicals to mix together in the water column. To avoid this risk and any associated environmental effects, DBW will perform chemical residue testing during the period following the Reward (Diquat) treatment to assure that no Reward (Diquat) is detectable in the water prior to treating the site with Sonar Precision Release. This newly added mitigation measure is specified in Exhibit F-1 (shown in bold under Aquatic Invertebrates and Fish: Direct Impacts).

Based on DBW’s two years of EDCP experience to date, DBW has found that Reward (Diquat) is not detectable in the water column after 4 to 5 days following treatment because the herbicide readily binds with particulate matter in the water. In limited sequential test applications of Sonar Precision Release following Reward (Diquat) treatments in the Delta, DBW determined at two Delta locations that Reward (Diquat) was non-detectable in the treatment area approximately 4 to 8 days following treatment. It is expected that these 4 to 8 day intervals will be similar to those observed in future sequential treatments.

There also is the possibility that a Sonar Precision Release treatment following a Reward (Diquat) treatment could result in a prolonged decrease in dissolved oxygen levels. The Reward (Diquat) label indicates “treatment of dense weed areas may result in oxygen loss from decomposition of dead weeds. This loss of oxygen may cause fish suffocation.” The Reward (Diquat) label thus specifies a 14-day interval between repeat Reward (Diquat) treatments. Based on this label language, the 14-day interval is designed solely to avoid these dissolved oxygen sags. These potential dissolved oxygen level impacts from Reward applications are already cited in the 2001 EDCP EIR as unavoidable significant impacts to fish habitat.

To mitigate the potential for dissolved oxygen impacts, as with any EDCP treatment, DBW will closely monitor dissolved oxygen conditions in the water, and will not begin a sequential Sonar Precision Release treatment following a Reward (Diquat) treatment if ambient dissolved oxygen levels are below 5.0 mg/L. However, if ambient dissolved oxygen levels are above 5.0 mg/L and no Reward (Diquat) residue is measured as detectable, DBW may initiate a follow up Sonar Precision Release treatment prior to the 14-day dissolved oxygen interval recommended for Reward (Diquat) treatments. This decision also is supported by the fact that (1) Sonar Precision Release has less tendency to reduce dissolved oxygen levels, and (2) there is a delayed period of action of Sonar Precision Release of at least approximately 8 days.

A 5.0 mg/L level of dissolved oxygen in the water provides an adequate margin of safety based on dissolved oxygen standards for the Delta. These standards state that “within the legal boundaries of the Delta, the dissolved oxygen concentration shall not be reduced below 7.0 mg/l in the Sacramento River...and in all Delta waters west of the Antioch Bridge; 6.0 mg/l in the San Joaquin River...; and 5.0 mg/l in all other Delta waters except for those bodies of water which are constructed for special purposes...” All 35 EDCP sites fall under the third category above and should therefore not fall below 5.0 mg/L.

Finally, sequential treatment of Reward (Diquat) followed by Sonar Precision Release does not appear to have the potential for any additional new direct toxicity impacts to biological resources, beyond those that were previously stated in the 2001 EDCP EIR. In support of this conclusion, **Appendix G** provides bio-toxicity test data results from limited sequential test applications of Sonar Precision Release following Reward (Diquat) treatments at two sites in the Delta. These data reveals that:

- ❑ For each site, samples collected from water treated with Sonar Precision Release following Reward (Diquat) had minimal bio-toxicity impacts attributable to the sequential applications.
- ❑ For tests using *Selenastrum capricornutum* (algae) sample growth rates were not statistically different from control growth rates.
- ❑ For the 96-hour and 7-day toxicity tests using *Ceriodaphnia dubia* (water flea), there was no difference between sample and control survival. Similarly, chronic toxicity tests on *Ceriodaphnia dubia* progeny were not statistically different between sample and control.

- For 96-hour and 7-day toxicity tests using *Pimephales promelas* (fathead minnow), samples had at least a 7-day 60 percent survival rate in all cases. For the *Pimephales promelas* growth test, only one sample showed a statistically significant difference from the control, with the individual average sample growth equal to 75 percent of the control level. However, this sample was in the receiving waters (not within the treatment site), and chemical residue tests did not show residue present at this site, so it is possible that some other constituent was present in the water.

Appendix H, an excerpt from the DBW's 2002 Annual Report, provides a further descriptive analysis of this data.

Diagrams shown in Exhibit B-1 show that there is likely less added harm from the transient higher concentration of Sonar Precision Release applications. While Sonar Precision Release tends to have a larger concentration in the waterway than other forms of Sonar for a longer period of time, concentrations reported by *SePro* were no more than 4 ppb over the lifecycle of a treatment, and tended to range between 2 and 4 ppb, all concentrations well below those documented to pose harm in the 2001 EDCP EIR.

In actual EDCP applications, Sonar concentrations have been recorded higher than the 2 to 4 ppb range identified in Exhibit B-1. These higher concentrations likely are a function of the potential large variation in site conditions in the Delta at the time of treatment. Actual Sonar concentrations for the EDCP are reported in section A.5 of the 2002 EDCP Annual Report prepared by the DBW (available through the DBW). During chemical residue testing for 2002, the DBW reported Sonar concentrations of up to 17.25 ppb. However, concentrations observed never exceeded the targeted label concentration for Sonar of between 10 ppb and 40 ppb. All of these observed Sonar concentrations are consistent with those contemplated in the 2001 EDCP EIR, and thus would not pose new environmental effects under this addendum.



Section 5.0

Conclusions

5.0 Conclusions

Based on the above analysis and discussion, no revisions are needed in the 2001 EDCP EIR because substantial changes in the proposed action relevant to environmental concerns have not occurred, no new significant impacts would result from the proposed changes included in the project, no substantial changes to environmental circumstances have occurred since the 2001 EDCP EIR was certified in March 2001, and because no new information relevant to environmental concerns bearing on the proposed action has come to light that would indicate the potential for new significant impacts not discussed in the 2001 EDCP EIR.

DBW believes that an addendum to the 2001 EDCP EIR is considered the appropriate CEQA document for the addition of Sonar Precision Release to the EDCP. None of the conditions in Section 15162 (for a subsequent EIR) apply for this project as currently proposed and, as a result, the conditions in Section 15163 (for a supplemental EIR) also do not apply.

While substitution of Sonar Precision Release for Reward (Diquat) will reduce some of the impacts of the EDCP, because Reward (Diquat) will continue to be an option for the EDCP (i.e., DBW is not proposing to remove Reward (Diquat) from the EDCP), the potential for unavoidable significant impacts from the EDCP does not change from the original 2001 EDCP EIR. Nonetheless, incorporating Sonar Precision Release into the EDCP is expected to lead to fewer overall impacts than the project approved in the 2001 EDCP EIR.



Appendix A

Flexibility for Changes in the 2001 EIR

Many areas of the 2001 EDCP EIR support DBW readily incorporating improved herbicide variants, such as Sonar Precision Release, into the EDCP. DBW originally intended to design an EDCP that could be adaptively managed as new and better information about the program became available. As stated in the 2001 EDCP EIR, “the DBW designed a flexible EDCP that would be adjusted as new information is generated about EDCP efficacy and environmental impacts” (page 1-3).

In the 2001 EDCP EIR (page 1-4), six fundamental program actions are associated with adaptive management. Of the six, three contain language that would support the addition of the new Sonar Precision Release method:

1. Evaluate the need for control measures on a site-by-site basis
4. Support ongoing research to explore alternative control methodologies
6. Adjust program actions as necessary in response to recommendations and evaluations by regulatory agencies and stakeholders.

Among the nine objectives for the EDCP stated in the 2001 EDCP EIR (Table 1-1, page 1-6), the following three objectives suggest that DBW is within the intent of the 2001 EDCP EIR to incorporate the Sonar Precision Release method:

3. Utilize the most efficacious method available with the least environmental impacts
5. Employ a combination of control methods to allow maximum flexibility
6. Improve the EDCP as more information is available on control methods used in the Delta.

As indicated on page 1-4 of the 2001 EDCP EIR, DBW based the program on Maintenance Control (MC) Practices, which “refer to practices that minimize plant biomass through regular, low-level, control treatments applied at times during a plant’s life cycle when treatments are most effective. To minimize potential environmental impacts, DBW would select the most appropriate chemical and/or mechanical control methods for a given site in the Delta based upon that site’s conditions. DBW also proposes to monitor results of the EDCP and base future control methods on these results. The selected method should attempt to provide the greatest reduction in *Egeria densa* biomass while avoiding or minimizing environmental impacts.”

The 2001 EDCP EIR also left open a degree of latitude for DBW in determining which methods to use for treatment sites. While at the time the 2001 EDCP EIR was prepared DBW did use “a structured decision-making process to determine which sites it would treat,” and a “methodology for determining the potential control methods it would use and how control results would be monitored,” the 2001 EDCP EIR did specify that DBW also would “use this methodology for determining potential new sites to treat, methods to use, and monitoring procedures.”

Exhibit 1-6 of the 2001 EDCP EIR identifies a total of four sites that were designated Reward (Diquat) treatment sites and/or Sonar treatment sites as part of the five-year EDCP. These sites suggest that the intent of the EDCP was to provide flexibility in use of EDCP methods over time.



Appendix B

***SePro* Description of
Sonar Precision Release**

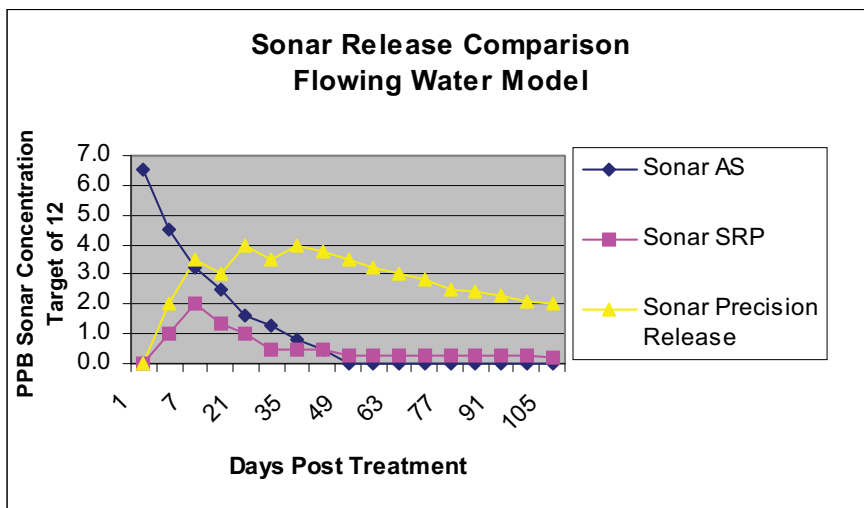
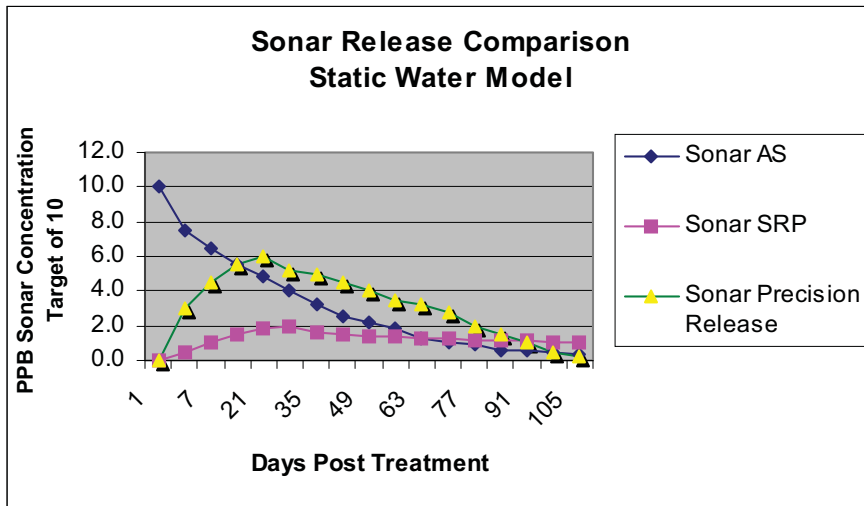
According to *SePro*, the manufacturer of Sonar, Sonar Precision Release herbicide has an improved release formula. The carrier matrix and delivery system for Sonar Precision Release has been changed from Sonar SRP to provide an accelerated release with higher, more sustainable Sonar concentrations.

In Sonar Precision Release, the release matrix is a fiber-like construction with a higher clay content so that it dissolves and releases differently than Sonar SRP. A Sonar Precision Release pellet remains in its intended location better than a Sonar SRP. Because Sonar Precision Release can maintain a higher concentration than other types of Sonar, Sonar Precision Release applications are better suited in areas prone to water movement and dilution such as the Delta.

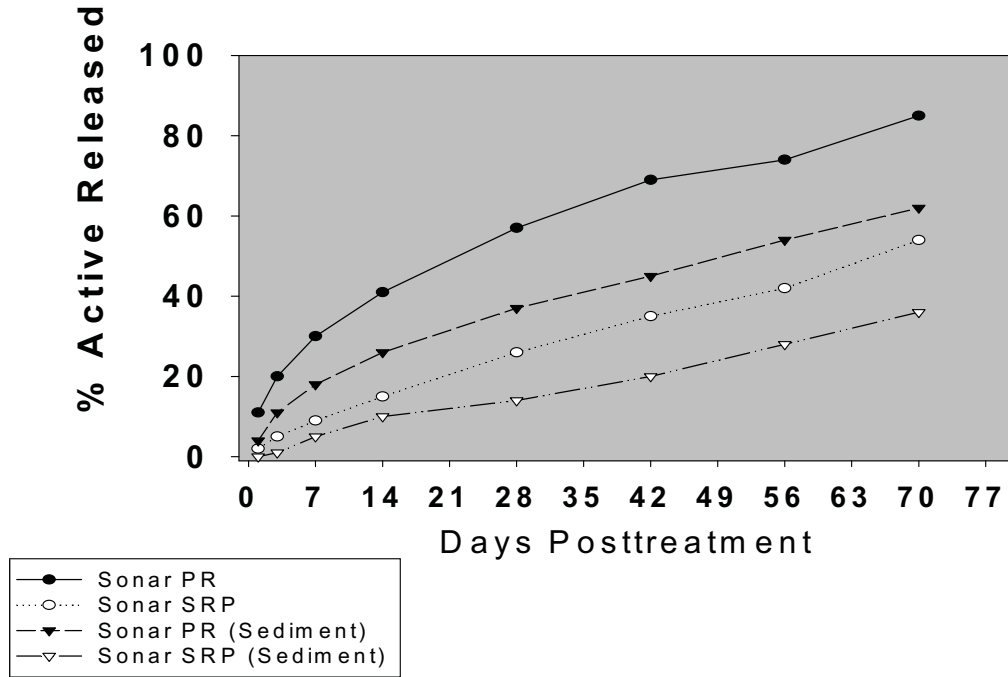
As evidence of the benefits expected from Sonar Precision Release, *SePro* provided the graphical comparisons in **Exhibit B-1** on the following page. In both flowing water and static water conditions (the first two charts), Sonar Precision Release maintains a higher, more consistent concentration in the waterway over a longer period of time than Sonar AS or Sonar SRP. Additionally, in contrast to Sonar SRP, Sonar Precision Release releases a greater amount of its active ingredient into the waterway and therefore has less tendency to accumulate in sediment (as shown in the third chart on the bottom of Exhibit B-1).

Additionally, the features, advantages, and benefits of Sonar Precision Release are described in the document following Exhibit B-1.

**Sonar Precision Release Compared with other Forms of Sonar Static Water,
 Flowing Water and Impact of Sediment on Release
 (Data Provided by SePro)**



**Sonar Precision Release Compared with other Forms of Sonar Static Water,
Flowing Water and Impact of Sediment on Release
(Data Provided by SePro)**



Sonar* Precision Release* is an excellent tool for water resource managers challenged by difficult to control aquatic plants or plants with an increased tolerance to fluridone. Sonar Precision Release pellets deliver an accelerated release of the active ingredient that allows for more precision in measuring available fluridone concentrations.




Available in 30 lb. pails, Sonar Precision Release possesses a unique release profile. With a faster release than current SRP formulations and longer-lasting residuals than Sonar A.S., Sonar Precision Release delivers enhanced performance in difficult treatment sites. Sonar Precision Release pellets can be applied by utilizing conventional application equipment suitable for Sonar SRP.

Feature	Advantage	Benefit
1. New Precision Release formulation.	A much faster product release than current SRP formulations, to provide accurate and consistent concentration monitoring.	More predictable and measurable results—giving you greater confidence that the product is available for plant control.
2. New carrier matrix and delivery system.	Accelerated release with higher, more sustainable Sonar concentrations that are easily detectable by FasTEST.*	Increased application options for greater flexibility in systems with dilution or flow.
3. More predictable Precision Release formula.	Higher performance for tough-to-control aquatic plants and plants with increased fluridone tolerance.	Fewer re-treatments required—saving time and money, in addition to increasing water use and customer satisfaction.
4. Accelerated release on a variety of sediment types.	Increased release rate and less product tie-up with higher organic sediment types compared to current SRP formulations.	Less concern with product tie-up—more product available for plant control.
5. Higher concentrations available earlier in product's use life.	Lake managers have better control over timing to achieve the highest concentrations during the time of maximum plant growth.	Enhanced efficacy and more consistent results from your application.
6. Unique precision release pellet formula helps resist initial photo degradation.	Less product immediately exposed to harmful UV light in the water column vs. liquid fluridone treatments—avoiding initial loss to photo degradation.	Increased control of aquatic plants, especially in shallow waters, providing a higher value of return for product dollars spent.
7. Pellet formula with a higher release rate.	Pellet stays in place in moving water and releases faster to counter dilution compared to current SRP formulations.	Better control in flowing water or in situations where dilution is a concern.
8. Consistent pellet size and 5% Sonar concentration.	Will fit conventional application equipment, use patterns and standard Sonar SRP protocols.	Familiarity with use will require less training—faster more successful adoption into field operations.
9. EPA registered and field-tested.	SePRO has secured the registration and has extensively tested Sonar PR before market introduction.	Greater confidence in successfully obtaining permits to treat large and or sensitive sites.
10. A faster and more sustainable release of Sonar product.	Detectable concentrations occur sooner for documentation by FasTEST while still allowing extended exposure.	Greater confidence that product is available for plant control.

SePRO Corporation

SePRO Corporation is a national organization with a full line of products devoted to aquatic ecosystem restoration. A carefully-prescribed aquatic plant management plan featuring the use of SePRO herbicides-backed by a thorough research and development department and a hands-on team of knowledgeable Aquatic Specialists-makes water usable for recreation, brings the fish population back into balance and restores property values.

Feature	Advantage	Benefit
<p>SePRO has more Aquatic Specialists throughout the U.S. than any other aquatic product company.</p>	<p>SePRO products are supported by sound technical advice from field experts familiar with native and exotic vegetation.</p>	<p>SePRO Aquatic Specialists work with applicators in your area to prescribe a treatment plan unique to your aquatic weed or algae problem. The treatment strategy is backed by years of thorough research, field-trial studies, a high degree of product knowledge and a proven track record.</p>
<p>Research and Development</p>	<p>Ongoing research and development efforts work to advance the science of aquatic weed control with the latest product technologies.</p>	<p>Comprehensive research in the laboratory and field allows SePRO to demonstrate results and maximize each product to its potential. Dedication to actively seeking new products makes SePRO a world leader in advancing the science of aquatic plant management.</p>
<p>Cooperative research and regulatory efforts and consistent interaction with state regulatory agencies.</p>	<p>SePRO is recognized by state agencies as a committed, reliable partner.</p>	<p>SePRO brings a track-record of long-term aquatic habitat restoration in accordance with local guidelines. SePRO specialists are available to assist with regulations and permitting to expedite the rehabilitation of your waaterbody.</p>
<p>Preferred Applicator Program.</p> 	<p>SePRO has partnered with a nation-wide team of elite aquatic applicators to build as alliance of dedicated professionals well-trained i, n the effective use of SePRO aquatic plant management products.</p>	<p>SePRO Preferred Applicators throughout the).S. possess insider knowledge of SePRO's products and services. The partnership between SePRO and its Preferred Applicators ensures that the right tool will be used to its potential for the right job.</p>



Appendix C

Label and Material Safety Data Sheets

- Sonar Precision Release
- Sonar Slow Release Pellet

Directions for Use

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

Read all Directions Carefully Before Applying Sonar PR Precision Release.

Storage and Disposal

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

Storage: Store in original container only. Do not store near feed or foodstuffs. In case of leak or spill, contain material and dispose as waste.

Pesticide Disposal: Wastes resulting from use of this product may be used according to label directions or disposed of at an approved waste disposal facility.

Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by State and Local authorities, by burning. If burned, stay out of smoke.

General Information

Sonar PR Precision Release herbicide is a selective systemic aquatic herbicide for management of aquatic vegetation in fresh water ponds, lakes, reservoirs, drainage canals, irrigation canals, and rivers. Sonar PR Precision Release is a pelleted formulation containing 5% fluridone. Sonar is absorbed from water by plant shoots and from hydrosol by the roots of aquatic vascular plants. It is important to maintain Sonar in contact with the target plants for as long as possible. Rapid water movement or any condition which results in rapid dilution of Sonar in treated water will reduce its effectiveness. In susceptible plants, Sonar inhibits the formation of carotene. In the absence of carotene, chlorophyll is rapidly degraded by sunlight. Herbicidal symptoms of Sonar appear in seven to ten days and appear as white (chlorotic) or pink growing points. Under optimum conditions 30 to 90 days are required before the desired level of aquatic weed management is achieved with Sonar. Species susceptibility to Sonar PR Precision Release may vary depending on time of year, stage of growth and water movement. For best results, apply Sonar PR Precision Release prior to initiation of weed growth or when weeds begin active growth. Application to mature target plants may require higher application rates and may take longer to control.

Sonar PR Precision Release is not corrosive to application equipment.

The label provides recommendations on the use of a chemical analysis for the active ingredient. SePRO Corporation recommends the use of an Enzyme-Linked Immunoassay (ELISA Test) for the determination of the active ingredient concentration in the water. Contact SePRO Corporation for the utilization of this test, known as FasTEST, for the incorporation of this analysis in your treatment program. Other proven chemical analyses for the active ingredient may also be used. The chemical analysis, FasTEST, is referenced in this label as the preferred method for the rapid determination of the concentration of the active ingredient in the water.

Application rates are provided in pounds of Sonar PR Precision Release to achieve a desired concentration of the active ingredient in part per billion (ppb). The maximum application rate or sum of all application rates is 90 ppb in ponds and 150 ppb in lakes and reservoirs per annual growth cycle. This maximum concentration is the amount of product calculated as the target application rate, NOT determined by testing the residues of the active ingredient in the treated water.

General Use Precautions

• **Obtain Required Permits:** Consult with appropriate state or local water authorities before applying this product. Permits may be required by state or local public agencies.

• **NEW YORK STATE:** Application of Sonar PR is not permitted in waters less than two (2) feet deep.

• **Hydroponic Farming:** Do not use Sonar PR treated water for hydroponic farming.

• **Greenhouse and Nursery Plants:** Do not use Sonar PR treated water for irrigating greenhouse or nursery plants. Use of an approved assay should confirm that residues are <1 ppb.

WATER USE RESTRICTIONS FOLLOWING APPLICATIONS WITH SONAR PR PRECISION RELEASE (DAYS)

Application Rate	Drinking†	Fishing	Swimming	Livestock/Pet Consumption	Irrigation**
Maximum Rate (150 ppb) or less	0	0	0	0	See irrigation instructions below

† Note below, under Potable Water Intakes, the information for application of Sonar PR within ¼ miles (1320) feet of a functioning potable water intake.

** Note below, under Irrigation, specific time frames or fluridone residues that provide the widest safety margin for irrigating with fluridone treated water.

• **Potable Water Intakes:** Concentrations of the active ingredient fluridone up to 150 ppb are allowed in potable water sources; however, in lakes and reservoirs or other sources of potable water, DO NOT APPLY Sonar PR Precision Release at application rates greater than 20 ppb within one-fourth mile (1320 feet) of any functioning potable water intake. At application rates of 8-20 ppb, Sonar PR Precision Release MAY BE APPLIED where functioning potable water intakes are present. **Note: Existing potable water intakes which are no longer in use, such as those replaced by connections to potable water wells or a municipal water system, are not considered to be functioning potable water intakes.**

• **Irrigation:** Irrigation with Sonar PR Precision Release treated water may result in injury to the irrigated vegetation. SePRO Corporation recommends following these precautions and informing those who irrigate from areas treated with Sonar PR Precision Release of the irrigation time frames or water assay requirements presented in the table below. These time frames and assay recommendations are suggestions which should be followed to reduce the potential for injury to vegetation irrigated with water treated with Sonar PR Precision Release. Greater potential for crop injury occurs where Sonar PR Precision Release treated water is applied to crops grown on low organic and sandy soils.

Application Site	Days After Application		
	Established Tree Crops	Established Row Crops/Turf/Plants	Newly Seeded Crops/Seedbeds or Areas to be Planted Including Overseeded Golf Course Greens
†Ponds and Static Canals	7	30	Assay required
Canals	7	7	Assay required
Rivers	7	7	Assay required
**Lakes and Reservoirs	7	7	Assay required

†For purposes of Sonar PR Precision Release labeling, a pond is

defined as a body of water 10 acres or less in size. A lake or reservoir is greater than 10 acres.

†In lakes and reservoirs where one-half or greater of the body of water is treated, use the pond and static canal irrigation precautions.

Where the use of Sonar PR Precision Release treated water is desired for irrigating crops prior to the time frames established above, the use of FasTEST assay is recommended to measure the concentration in the treated water. Where FasTEST has determined that concentrations are less than 10 parts per billion, there are no irrigation precautions for irrigating established tree crops, established row crops or turf. **For tobacco, tomatoes, peppers or other plants within the Solanaceae Family and newly seeded crops or newly seeded grasses such as overseeded golf course greens, do not use Sonar PR treated water if concentration are greater than 5 ppb. Furthermore, when rotating crops, do not plant members of the Solanaceae family in land that has been previously irrigated with fluridone concentrations in excess of 5 ppb. It is recommended that an aquatic specialist be consulted prior to commencing irrigation of these sites.**

Plant Control Information

Sonar PR Precision Release selectivity is dependent upon dosage, time of year, stage of growth, method of application, and water movement. The following categories, controlled, partially controlled, and not controlled are provided to describe expected efficacy under ideal treatment conditions using higher to maximum label rates. Use of lower rates will increase selectivity of some species listed as controlled or partially controlled. Additional aquatic plants may be controlled, partially controlled, or tolerant to Sonar PR Precision Release. Consult an aquatic specialist prior to application of Sonar PR Precision Release to determine a plant's susceptibility to Sonar PR Precision Release.

Vascular Aquatic Plants Controlled by Sonar PR Precision Release†

Submersed Plants:

bladderwort (*Utricularia* spp.)
common coontail (*Ceratophyllum demersum*)*
common Elodea (*Elodea canadensis*)*
egeria, Brazilian Elodea (*Egeria densa*)
fanwort, Cabomba (*Cabomba caroliniana*)
hydrilla (*Hydrilla verticillata*)
naiad (*Najas* spp.)*
pondweed (*Potamogeton* spp., except Illinois pondweed)*
watermilfoil (*Myriophyllum* spp. except variable-leaf milfoil)

Shoreline Grasses:

paragrass (*Urochloa mutica*)

†Species denoted by an asterisk are native plants that are often tolerant to Sonar at lower use rates. Please consult an aquatic specialist for recommended Sonar PR Precision Release use rates when selective control of exotic species is desired.

Vascular Aquatic Plants Partially Controlled by Sonar PR Precision Release:

Floating Plants:

Salvinia (*Salvinia* spp.)

Emerald Plants:

alligatorweed (*Alternanthera philoxeroides*)
American lotus (*Nelumbo lutea*)
cattail (*Typha* spp.)
creeping waterprimrose (*Ludwigia peploides*)

parrotfeather (*Myriophyllum aquaticum*)
smartweed (*Polygonum* spp.)
spatterdock (*Nuphar luteum*)
spikerush (*Eleocharis* spp.)
waterlily (*Nymphaea* spp.)
waterpurslane (*Ludwigia palustris*)
watershield (*Brasenia schreberi*)

Submersed Plants:

Illinois pondweed (*Potamogeton illinoensis*)
limnophila (*Limnophila sessiliflora*)
tapegrass, American eelgrass (*Vallisneria americana*)
watermilfoil--variable-leaf (*Myriophyllum heterophyllum*)

Shoreline Grasses:

barnyardgrass (*Echinochloa crusgalli*)
giant cutgrass (*Zizaniopsis miliacea*)
reed canarygrass (*Phalaris arundinaceae*)
southern watergrass (*Hydrochloa caroliniensis*)
torpedograss (*Panicum repens*)

Vascular Aquatic Plants Not Controlled by Sonar PR Precision Release:

Floating Plants:

floating waterhyacinth (*Eichhornia crassipes*)
waterlettuce (*Pistia stratiotes*)

Emerald Plants:

American frogbit (*Limnobium spongia*)
arrowhead (*Sagittaria* spp.)
bacopa (*Bacopa* spp.)
big floatingheart, banana lily (*Nymphoides aquatica*)
bulrush (*Scirpus* spp.)
pickerelweed, lanceleaf (*Pontederia* spp.)
rush (*Juncus* spp.)
water pennywort (*Hydrocotyle* spp.)

Shoreline Grasses:

maidencane (*Panicum hemitomon*)

Note: algae (chara, nitella, and filamentous species are not controlled by Sonar PR Precision Release).

Application Directions

The aquatic plants present in the treatment site should be identified prior to application to determine their susceptibility to Sonar PR Precision Release. It is important to determine the area (acres) to be treated and the average depth in order to select the proper application rate. Do not exceed the maximum labeled rate for a given treatment site per annual growth cycle.

Application to Ponds

Sonar PR Precision Release may be applied to the entire surface area of a pond. For single applications, rates may be selected to provide 45 to 90 ppb to the treated water, although actual concentrations in treated water may be substantially lower at any point in time due to the slow-release formulation of this product. When treating for optimum selective control, lower rates may be applied for sensitive target species. Use the higher rate within the rate range where there is a dense weed mass, when treating more difficult to control species, and for ponds less than 5 acres in size with an average depth less than 4 feet. Application rates necessary to obtain these concentrations in treated water are shown in the following table. For additional application rate calculations, refer to page 5—Application Rate Calculations-Ponds, Lakes and Reservoirs. Split or multiple applications are recommended where dilution of treated water is anticipated; however, the sum of all applications should total 45 to 90 ppb and must not exceed a total of 90 ppb per annual growth cycle.

Average Water Depth of Treatment Site (feet)	Pounds of Sonar PR Precision Release per Treated Surface Acre	
	45 ppb	90 ppb
1	2.5	5
2	5	10
3	7.5	15
4	10	20
5	12.5	25
6	15	30
7	17	34
8	19.5	39
9	22	44
10	24.5	49

Application to Lakes and Reservoirs

The following treatments are recommended for treating both whole lakes or reservoirs and partial areas of lakes or reservoirs (bays, etc.). For best results in treating partial lakes and reservoirs, Sonar PR Precision Release treatment areas should be a minimum of 5 acres in size. Treatment of areas smaller than 5 acres or treatment of narrow strips such as boat lanes or shorelines may not produce satisfactory results due to dilution by untreated water. Rate ranges are provided as a guide to include a wide range of environmental factors, such as target species, plant susceptibility, selectivity and other aquatic plant management objectives. Application rates and methods should be selected to meet the specific lake/reservoir aquatic plant management goals.

A. Whole Lake or Reservoir Treatments (Limited or No Water Discharge)

1. Single Application to Whole Lakes or Reservoirs

Where single applications to whole lakes or reservoirs are desired, apply Sonar PR Precision Release at an application rate of 16 to 90 ppb. Application rates necessary to obtain these concentrations in treated water are shown in the following table. For additional rate calculations, refer to page 5—Application Rate Calculation-Ponds, Lakes and Reservoirs. Choose an application rate to meet the aquatic plant management objective. **Where greater plant selectivity is desired such as when controlling Eurasian watermilfoil and curlyleaf pondweed, choose an application rate lower in the rate range.** For other plant species, SePRO recommends contacting an aquatic specialist in determining when to choose application rates lower in the rate range to meet specific plant management goals. Use the higher rate within the rate range where there is a dense weed mass or when treating more difficult to control plant species or in the event of a heavy rainfall event where dilution has occurred. In these cases, a second application or more may be required; however, the sum of all applications cannot exceed 150 ppb per annual growth cycle. Refer to the following Section (No. 2) Split or Multiple Applications for guidelines and maximum rate allowed.

Average Water Depth of Treatment Site (feet)	Pounds of Sonar PR Precision Release Per Treated Surface Acre	
	16 ppb	90 ppb
1	0.9	5
2	1.7	10
3	2.6	15
4	3.5	20
5	4.3	25
6	5.2	30
7	6.0	34
8	6.9	39
9	7.8	44
10	8.6	49
11	9.5	54
12	10.4	59
13	11.2	64
14	12.1	68
15	13.0	73
16	13.8	78
17	14.7	83
18	15.6	88
19	16.4	93
20	17.3	98

2. Split or Multiple Applications to Whole Lakes or Reservoirs

To meet certain plant management objectives, split or multiple applications may be desired in making whole lake treatments. Split or multiple application programs are desirable when the objective is to use the minimum effective dose and to maintain this lower dose for the sufficient time to ensure efficacy and enhance selectivity. Under these situations, use the lower rates (16 to 75 ppb) within the rate range. **In controlling Eurasian watermilfoil and curlyleaf pondweed and where greater plant selectivity is desired, choose an application rate lower in the rate range.** For other plant species, SePRO recommends contacting an aquatic specialist in determining when to choose application rates lower in the rate range to meet specific plant management goals. For split or repeated applications, the sum of all applications must not exceed 150 ppb per annual growth cycle.

Note: In treating lakes or reservoirs that contain potable water intakes and the application requires treating within 1/4 mile of a potable water intake, no single application can exceed 20 ppb. Additionally, the sum of all applications cannot exceed 150 ppb per annual growth cycle.

B. Partial Lake or Reservoir Treatments

Where dilution of Sonar PR Precision Release with untreated water is anticipated, such as in partial lake or reservoir treatments, split or multiple applications may be used to extend the contact time to the target plants. The application rate and use frequency of Sonar PR Precision Release in a partial lake is highly dependent upon the treatment area. Higher application rates may be required and frequency of applications will vary depending upon the potential of untreated water diluting the Sonar PR Precision Release concentration in the treatment area. Use higher rates where greater dilution with untreated water is anticipated.

1. Application Sites Greater Than 1/4 Mile from a Functioning Potable Water Intake

For single applications, apply Sonar PR Precision Release at application rates from 45 to 150 ppb. Split or multiple applications may be made, however, the sum of all applications cannot

exceed 150 ppb per annual growth cycle. Split applications should be conducted to maintain a sufficient concentration in the target area for a period of 45 days or longer. The use of FasTEST is recommended to maintain the desired concentration in the target area over time.

2. Application Sites Within 1/4 Mile of a Functioning Potable Water Intake

In treatment areas that are within 1/4 mile of a potable water intake, no single application can exceed 20 ppb. When utilizing split or repeated applications of Sonar PR Precision Release for sites which contain a potable water intake, FasTEST is required to determine the actual concentration in the water. Additionally, the sum of all applications cannot exceed 150 ppb per annual growth cycle.

Application Rate Calculation - Ponds, Lakes and Reservoirs

The amount of Sonar PR Precision Release to be applied to provide the desired ppb concentration of active ingredient equivalents in treated water may be calculated as follows:

- Pounds of Sonar PR Precision Release required per treated acre = Average water depth of treatment site x Desired ppb concentration of active ingredient equivalents x 0.054

For example, the pounds per acre of Sonar PR Precision Release required to provide a concentration of 25 ppb of active ingredient equivalents in water with an average depth of 5 feet is calculated as follows:

$$5 \times 25 \times 0.054 = 6.75 \text{ pounds per treated surface acre.}$$

Note: Calculated rates should not exceed the maximum allowable rate in pounds per treated surface acre for the water depth listed in the application rate table for the site to be treated.

Application to Drainage Canals, Irrigation Canals and Rivers

Static Canals:

In static drainage and irrigation canals, Sonar PR Precision Release should be applied at the rate of 20 to 40 pounds per surface acre.

Moving Water Canals and Rivers:

The performance of Sonar PR Precision Release will be enhanced by restricting or reducing water flow. In slow moving bodies of water use an application technique that maintains a concentration of 10 to 40 ppb in the applied area for a minimum of 45 days. Sonar PR Precision Release can be applied by split or multiple broadcast applications or by metering in the product to provide a uniform concentration of the herbicide based upon the flow pattern. The use of FasTEST is recommended to maintain the desired concentration in the target area over time.

Static or Moving Water Canals or Rivers Containing a Functioning Potable Water Intake

In treating a static or moving water canal or river which contains a functioning potable water intake, applications of Sonar PR Precision Release greater than 20 ppb must be made more

than 1/4 mile from a functioning potable water intake. Applications less than 20 ppb may be applied within 1/4 mile from a functioning potable water intake; however, if applications of Sonar PR Precision Release are made within 1/4 mile from a functioning water intake, the FasTEST must be utilized to demonstrate that concentrations do not exceed 150 ppb at the potable water intake.

Application Rate Calculation – Drainage Canals, Irrigation Canals and Rivers

The amount of Sonar PR Precision Release to be applied through a metering system to provide the desired ppb concentration of active ingredient in treated water may be calculated as follows:

1. Average flow rate (feet per second) x average width (ft.) x average depth (ft.) x 0.9 = CFS (cubic feet per second)
2. CFS x 1.98 = acre feet per day (water movement)
3. Acre feet per day x desired ppb x 0.054 = pounds Sonar PR Precision Release required per day.

WARRANTY DISCLAIMER

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

INHERENT RISKS OF USE

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

LIMITATION OF REMEDIES

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

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

SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such losses or damages in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

The terms of the Warranty Disclaimer above and this Limitation of Remedies can not be varied by any written or verbal statements or agreements. No employee or sales agent of SePRO Corporation or the seller is authorized to vary or exceed the terms of the Warranty Disclaimer or Limitations of Remedies in any manner.

Material Safety Data Sheet



Transportation and Medical Emergency Phone: 800-535-5053
(INFOTRAC)

General Phone: 317-580-8282

EPA Reg. Number: 67690-12
Effective Date: October 20, 2001

SePRO Corporation • Carmel, IN

Sonar* PR Precision Release Herbicide

1. PRODUCT & COMPANY IDENTIFICATION

Product: Sonar* PR Precision Release Herbicide

Company:

SePRO Corporation
11550 North Meridian Street, Suite 600
Carmel, IN 46032-4565
www.sepro.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Fluridone: 1-Methyl-3-phenyl 5-(3-(Trifluoro-
methyl)phenyl)-4(1H)-Pyridinone
CAS # 059756-60-45%

Inert Ingredients, Total, Including Clay
(Crystalline Silica)
CAS # 001332-58-7 95%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Dark gray to dark brown pellet with a faint musty odor. May cause eye irritation. LD₅₀ for skin absorption in rabbits is >2000 mg/kg. Oral LD₅₀ for rats is >5000 mg/kg.

EMERGENCY TELEPHONE NUMBER:
(800) 535-5053

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: May cause slight eye irritation and/or slight transient (temporary) corneal injury.

SKIN: Essentially non-irritating to skin. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts. The LD₅₀ for skin absorption in rabbits is >2000 mg/kg. Fluridone did not cause allergic skin reactions when tested in guinea pigs.

INGESTION: Single dose oral toxicity is extremely low. The oral LD₅₀ for rats is >5000 mg/kg. No hazards anticipated from swallowing small amounts incidental to normal handling operations.

INHALATION: Single exposure to dust is not likely to be hazardous. Dust may cause irritation to upper respiratory tract (nose and throat).

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Fluridone, in animals, has been shown to cause liver and kidney effects. Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs. Some evidence suggests that kidney effects may result from excessive exposures also.

CANCER INFORMATION: Fluridone did not cause cancer in laboratory animals. This product contains clay that has naturally occurring crystalline silica as quartz. Crystalline silica is listed by IARC and NTP as a carcinogen for hazard communication purposes under OSHA Standard 29 CFR Part 1910.1200.7. Inhalation of excessive concentrations of any dust, including this material, may lead to lung injury.

TERATOLOGY (BIRTH DEFECTS): Fluridone did not cause birth defects; other fetal effects occurred only at doses toxic to the mother.

REPRODUCTIVE EFFECTS: Fluridone did not interfere with reproduction in animal studies.

4. FIRST AID

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

SKIN: 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.

INGESTION: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control

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Sonar* PR Precision Release Herbicide

center or doctor. Never give anything by mouth to an unconscious person.

INHALATION: Move person to fresh air. If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably by mouth to mouth. Call a poison control center or doctor for further treatment advice.

NOTES TO PHYSICIAN: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES

FLASH POINT: Not applicable
METHOD USED: Not applicable

FLAMMABLE LIMITS: LFL: Not applicable
UFL: Not applicable

AUTO-IGNITION TEMPERATURE: No ignition up to 1382°F (750°C).

EXTINGUISHING MEDIA: Use water, CO₂, or dry chemicals.

FIRE AND EXPLOSION HAZARDS: Will emit toxic vapors as it burns.

FIREFIGHTING EQUIPMENT: Wear positive-pressure, self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO TAKE FOR SPILLS AND LEAKS: Contain and sweep up small spills and dispose as waste. Report large spills to INFOTRAC and consult SePRO Corporation for assistance. Prevent runoff.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Keep out of reach of children. Harmful if swallowed, absorbed through the skin, or inhaled. Avoid breathing dust or contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Wash exposed clothing before reuse.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINES: Crystalline silica: ACGIH TLV is 0.05 mg/M³ for quartz, tripoli, and fused silica; 0.05 mg/M³ (respirable) for cristobalite and tridymite. OSHA PEL is 10/%SiO₂ + 2 mg/M³ (respirable) for quartz, tripoli, and fused silica; 1/2 the value calculated from the respirable dust formula for quartz for cristobalite and tridymite.

PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING COMMERCIAL BLENDING, AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guidelines. In dusty atmospheres, use a NIOSH approved dust respirator.

SKIN PROTECTION: Use gloves impervious to this material.

EYE/FACE PROTECTION: Use safety glasses.

APPLICATORS AND ALL OTHER HANDLERS: Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES

SOLUBILITY IN WATER: Insoluble (disintegrates in water).

APPEARANCE: Dark gray or dark brown pellet.

ODOR: Faint musty.

pH: (aqueous 50/50) 3.5.

10. STABILITY AND REACTIVITY

STABILITY: Stable under normal storage conditions.

Material Safety Data Sheet



Transportation and Medical Emergency Phone: 800-535-5053
(INFOTRAC)

General Phone: 317-580-8282

Sonar* PR Precision Release Herbicide

EPA Reg. Number: 67690-12
Effective Date: October 20, 2001

SePRO Corporation • Carmel, IN

INCOMPATIBILITY: (Specific materials to avoid)
Not determined.

HAZARDOUS DECOMPOSITION PRODUCTS:
None known.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION

MUTAGENICITY: For fluridone, in-vitro mutagenicity studies were predominantly negative and animal mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION

Following label use directions carefully so as to avoid adverse effects on non-target organisms. In order to avoid impact on threatened or endangered aquatic plant or animal species, users must consult their state fish and game agency or the U.S. Fire and Wildlife Service before making applications. Do not contaminate water when disposing of equipment wash waters. Trees and shrubs growing in water treated with Sonar PR Precision Release may be injured. Do not apply in tidewater or brackish waters.

13. DISPOSAL CONSIDERATIONS

DISPOSAL: Do not contaminate water, food, or feed by storage or disposal. Wastes resulting from the use of this product may be disposed of on site per label use directions or at an approved waste disposal facility. Follow all local, state, and federal requirements

14. TRANSPORTATION INFORMATION

For DOT regulatory information, if required, consult transportation regulations, product shipping papers, or your SePRO Corporation representative.

15. REGULATORY INFORMATION

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The

following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS:

SARA TITLE III, SECTION 313: To the best of our knowledge, this product contains no chemical subject to SARA Title III, Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An Immediate Health Hazard
A Delayed Health Hazard

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 701): (4=Extreme; 3=High; 2= Moderate; 0=Insignificant)

Health	1
Flammability	0
Reactivity	0

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in Section 1 of the MSDS.

Chemical Name	CAS Number	List
Crystalline Silica	001332-58-7	NJ3, PA1

NJ3=New Jersey Workplace Hazardous Substance (present at >= to 1.0%).

PA1= Pennsylvania Hazardous Substance (present at >= to 1.0%).

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined

Material Safety Data Sheet



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Sonar* PR Precision Release Herbicide

by the OSHA Hazard Communication Standard (29
CFR 1910.1200).

16. OTHER INFORMATION

MSDS STATUS: New

The Information Herein Is Given In Good Faith, But
No Warranty, Express or Implied, Is Made. Consult
SePRO Corporation for Further Information.

A-74-MC-02(01)
Revised 10/20/01

Environmental Hazards

Follow use directions carefully so as to minimize adverse effects on nontarget organisms. In order to avoid impact on threatened or endangered aquatic plant or animal species, users must consult their State Fish and Game Agency or the U.S. Fish and Wildlife Service before making applications.

Do not contaminate untreated water when disposing of equipment washwaters. Trees and shrubs growing in water treated with Sonar SRP may occasionally develop chlorosis. Do not apply in tidewater/brackish water.

Lowest rates should be used in shallow areas where the water depth is considerably less than the average depth of the entire treatment site, for example, shallow shoreline areas.

Directions for Use

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

Read all Directions Carefully Before Applying Sonar SRP.

General Information

Sonar SRP herbicide is a selective systemic aquatic herbicide for management of aquatic vegetation in fresh water ponds, lakes, reservoirs, drainage canals, irrigation canals, and rivers. Sonar SRP is a pelleted formulation containing 5% fluridone. Sonar is absorbed from water by plant shoots and from hydrosol by the roots of aquatic vascular plants. It is important to maintain Sonar in contact with the target plants for as long as possible. Rapid water movement or any condition which results in rapid dilution of Sonar in treated water will reduce its effectiveness. In susceptible plants, Sonar inhibits the formation of carotene. In the absence of carotene, chlorophyll is rapidly degraded by sunlight. Herbicidal symptoms of Sonar appear in seven to ten days and appear as white (chlorotic) or pink growing points. Under optimum conditions 30 to 90 days are required before the desired level of aquatic weed management is achieved with Sonar. Species susceptibility to Sonar SRP may vary depending on time of year, stage of growth and water movement. For best results, apply Sonar SRP prior to initiation of

weed growth or when weeds begin active growth. Application to mature target plants may require higher application rates and may take longer to control.

Sonar SRP is not corrosive to application equipment.

The label provides recommendations on the use of a chemical analysis for the active ingredient. SePRO Corporation recommends the use of an Enzyme-Linked

Immunoassay (ELISA Test) for the determination of the active ingredient concentration in the water. Contact SePRO Corporation for the utilization of this test, known as FasTEST, for the incorporation of this analysis in your treatment program. Other proven chemical analyses for the active ingredient may also be used. The chemical analysis, FasTEST, is referenced in this label as the preferred method for the rapid determination of the concentration of the active ingredient in the water.

Application rates are provided in pounds of Sonar SRP to achieve a desired concentration of the active ingredient in part per billion (ppb). The maximum application rate or sum of all application rates is 90 ppb in ponds and 150 ppb in lakes and reservoirs per annual growth cycle. This maximum concentration is the amount of product calculated as the target application rate, NOT determined by testing the residues of the active ingredient in the treated water.

General Use Precautions

- **Obtain Required Permits:** Consult with appropriate state or local water authorities before applying this product. Permits may be required by state or local public agencies.
- **NEW YORK STATE:** Application of Sonar SRP is not permitted in waters less than two (2) feet deep.
- **Hydroponic Farming:** Do not use Sonar SRP treated water for hydroponic farming.
- **Greenhouse and Nursery Plants:** Do not use Sonar SRP treated water for irrigating greenhouse or nursery plants. Use of an approved assay should confirm that residues are <1 ppb.
- **WATER USE RESTRICTIONS FOLLOWING APPLICATIONS WITH SONAR SRP (DAYS)**

Application Rate	Drinking†	Fishing	Swimming	Livestock/Pet Consumption	Irrigation††
Maximum Rate (150 ppb) or less	0	0	0	0	See irrigation instructions below

† Note below, under Potable Water Intakes, the information for application of Sonar S.R.P. within 1/4 miles (1320) feet of a functioning potable water intake.

†† Note below, under Irrigation, the specific time frames for fluridone residues that provide the widest safety margin for irrigating with fluridone treated water.

- **Potable Water Intakes:** Concentrations of the active ingredient fluridone up to 150 ppb are allowed in potable water sources; however, in lakes and reservoirs or other sources of potable water, **DO NOT APPLY** Sonar SRP at application rates greater than 20 ppb within one-fourth mile (1320 feet) of any functioning potable water intake. At application rates of 8-20 ppb, Sonar SRP **MAY BE APPLIED** where functioning potable water intakes are present. **Note: Existing potable water intakes which are no longer in use, such as those replaced by connections to potable water wells or a municipal water system, are not considered to be functioning potable water intakes.**

- **Irrigation:** Irrigation with Sonar SRP treated water may result in injury to the irrigated vegetation. SePRO Corporation recommends following these precautions and informing those who irrigate from areas treated with Sonar SRP of the irrigation time frames or water assay requirements presented in the table below. These time frames and assay recommendations are suggestions which should be followed to reduce the potential for injury to vegetation irrigated with water treated with Sonar SRP. Greater potential for crop injury occurs where Sonar SRP treated water is applied to crops grown on low organic and sandy soils.

Application Site	Days After Application		
	Established Tree Crops	Established Row Crops Turf/Plants	Newly Seeded Crops/Seedbeds or Areas to be Planted Including Overseeded Golf Course Greens
† Ponds and Static Canals	7	30	Assay required
Canals	7	7	Assay required
Rivers	7	7	Assay required
† † Lakes and Reservoirs	7	7	Assay required

† For purposes of Sonar SRP labeling, a pond is defined as a body of water 10 acres or less in size. A lake or reservoir is greater than 10 acres.

† † In lakes and reservoirs where one-half or greater of the body of water is treated, use the pond and static canal irrigation precautions.

Where the use of Sonar SRP treated water is desired for irrigating crops prior to the time frames established above, the use of FasTEST assay is recommended to measure the concentration in the treated water. Where FasTEST has determined that concentrations are less than 10 parts per billion, there are no irrigation precautions for irrigating established tree crops, established row crops or turf. **For tobacco, tomatoes, peppers or other plants within the Solanaceae Family and newly seeded crops or newly seeded grasses such as overseeded golf course greens, do not use Sonar SRP treated water if concentration are greater than 5 ppb.**

Furthermore, when rotating crops, do not plant members of the Solanaceae family in land that has been previously irrigated with fluridone concentrations in excess of 5 ppb. It is recommended that an aquatic specialist be consulted prior to commencing irrigation of these sites

Plant Control Information

Sonar SRP selectivity is dependent upon dosage, time of year, stage of growth, method of application, and water movement. The following categories, controlled, partially controlled, and not controlled are provided to describe expected efficacy under ideal treatment conditions using higher to maximum label rates. Use of lower rates will increase selectivity of some species listed as controlled or partially controlled. Additional aquatic plants may be controlled, partially controlled, or tolerant to Sonar SRP. Consult an aquatic specialist prior to application of Sonar SRP to determine a plant's susceptibility to Sonar SRP.

Vascular Aquatic Plants Controlled by Sonar SRP†

Submersed Plants:

bladderwort (*Utricularia* spp.)
 common coontail (*Ceratophyllum demersum*)*
 common Elodea (*Elodea canadensis*)*
 egeria, Brazilian Elodea (*Egeria densa*)
 fanwort, Cabomba (*Cabomba caroliniana*)
 hydrilla (*Hydrilla verticillata*)
 naiad (*Najas* spp.)*
 pondweed (*Potamogeton* spp., except Illinois pondweed)*
 watermilfoil (*Myriophyllum* spp. except variable-leaf milfoil)

Shoreline Grasses:

paragrass (*Urochloa mutica*)

† Species denoted by an asterisk are native plants that are often tolerant to Sonar at lower use rates. Please consult an aquatic specialist for recommended Sonar

SRP use rates when selective control of exotic species is desired.

Vascular Aquatic Plants Partially Controlled by Sonar SRP:

Floating Plants:

Salvinia (*Salvinia* spp.)

Emerged Plants:

alligatorweed (*Alternanthera philoxeroides*)
 American lotus (*Nelumbo lutea*)
 cattail (*Typha* spp.)
 creeping waterprimrose (*Ludwigia peploides*)
 parrotfeather (*Myriophyllum aquaticum*)
 smartweed (*Polygonum* spp.)
 spatterdock (*Nuphar luteum*)
 spikerush (*Eleocharis* spp.)
 waterlily (*Nymphaea* spp.)
 waterpurslane (*Ludwigia palustris*)
 watershield (*Brasenia schreber*)

Submersed Plants:

Illinois pondweed (*Potamogeton illinoensis*)
 limnophila (*Limnophila sessiliflora*)
 tapegrass, American eelgrass (*Vallisneria americana*)
 watermilfoil—variable-leaf (*Myriophyllum heterophyllum*)

Shoreline Grasses:

barnyardgrass (*Echinochloa crusgalli*)
 giant cutgrass (*Zizaniopsis miliacea*)
 reed canarygrass (*Phalaris arundinaceae*)
 southern watergrass (*Hydrochloa caroliniensis*)
 torpedograss (*Panicum repens*)

Vascular Aquatic Plants Not Controlled by Sonar SRP:

Floating Plants:

floating waterhyacinth (*Eichhornia crassipes*)
 waterlettuce (*Pistia stratiotes*)

Emerald Plants:

American frogbit (*Limnobium spongia*)
 arrowhead (*Sagittaria* spp.)
 bacopa (*Bacopa* spp.)
 big floatingheart, banana lily (*Nymphoides aquatica*)
 bulrush (*Scirpus* spp.)
 pickerelweed, lanceleaf (*Pontederia* spp.)
 rush (*Juncus* spp.)
 water pennywort (*Hydrocotyle* spp.)

Shoreline Grasses:

maiden cane (*Panicum hemitomon*)

Note: algae (chara, nitella, and filamentous species are not controlled by Sonar SRP)

Application Directions

The aquatic plants present in the treatment site should be identified prior to application to determine their susceptibility to Sonar SRP. It is important to determine the area (acres) to be treated and the average depth in order to select the proper application rate. Do not exceed the maximum labeled rate for a given treatment site per annual growth cycle.

Application to Ponds

Sonar SRP may be applied to the entire surface area of a pond. For single applications, rates may be selected to provide 45 to 90 ppb to the treated water, although actual concentrations in treated water may be substantially lower at any point in time due to the slow-release formulation of this product. When treating for optimum selective control, lower rates may be applied for sensitive target species. Use the higher rate within the rate range where there is a dense weed mass, when treating more difficult to control species, and for ponds less than 5 acres in size with an average depth less than 4 feet. Application rates necessary to obtain these concentrations in treated water are shown in the following table. For additional application rate calculations, refer to page 5—Application Rate Calculations-Ponds, Lakes and Reservoirs. Split or multiple applications are recommended where dilution of treated water is anticipated; however, the sum of all applications should total 45 to 90 ppb and must not exceed a total of 90 ppb per annual growth cycle.

Average Water Depth of Treatment Site (feet)	Pounds of Sonar SRP per Treated Surface Acre 45 ppb to 90 ppb	
1	2.5	5
2	5	10
3	7.5	15
4	10	20
5	12.5	25
6	15	30
7	17	34
8	19.5	39
9	22	44
10	24.5	49

Application to Lakes and Reservoirs

The following treatments are recommended for treating both whole lakes or reservoirs and partial areas of lakes or reservoirs (bays, etc.). For best results in treating partial lakes and reservoirs, Sonar SRP treatment areas should be a minimum of 5 acres in size. Treatment of areas smaller than 5 acres or treatment of narrow strips such as boat lanes or shorelines may not produce satisfactory results due to dilution by untreated water. Rate ranges are provided as a guide to include a wide range of environmental factors, such as target species, plant susceptibility, selectivity and other aquatic plant management objectives. Application rates and methods should be selected to meet the specific lake/reservoir aquatic plant management goals.

A. Whole Lake or Reservoir Treatments (Limited or No Water Discharge)**1. Single Application to Whole Lakes or Reservoirs**

Where single applications to whole lakes or reservoirs are desired, apply Sonar SRP at an application rate of 16 to 90 ppb. Application rates necessary to obtain these concentrations in treated water are shown in the following table. For additional rate calculations, refer to page 5—Application Rate Calculation-Ponds, Lakes and Reservoirs. Choose an application rate to meet the aquatic plant management objective. **Where greater plant selectivity is desired such as when controlling Eurasian watermilfoil and curlyleaf pondweed, choose an application rate lower in the rate range.** For other plant species, SePRO recommends contacting an aquatic specialist in determining when to choose application rates lower in the rate range to meet specific plant management goals. Use the higher rate within the rate range where there is a dense weed mass or when treating more difficult to control plant species or in the event of a heavy rainfall event where dilution has occurred. In these cases, a second application or more may be required; however, the sum of all applications cannot exceed 150 ppb per annual growth cycle. Refer to the following Section (No. 2) Split or Multiple Applications for guidelines and maximum rate allowed.

Average Water Depth of Treatment Site (feet)	Pounds of Sonar SRP Per Treated Surface Acre 16 ppb to 90 ppb	
1	0.9	5
2	1.7	10
3	2.6	15
4	3.5	20
5	4.3	25
6	5.2	30
7	6.0	34
8	6.9	39
9	7.8	44
10	8.6	49
11	9.5	54
12	10.4	59
13	11.2	64
14	12.1	68
15	13.0	73
16	13.8	78
17	14.7	83
18	15.6	88
19	16.4	93
20	17.3	98

2. Split or Multiple Applications to Whole Lakes or Reservoirs

To meet certain plant management objectives, split or multiple applications may be desired in making whole lake treatments. Split or multiple application programs are desirable when the objective is to use the minimum effective dose and to maintain this lower dose for the sufficient time to ensure efficacy and enhance selectivity. Under these situations, use the lower rates (16 to 75 ppb) within the rate range. **In controlling Eurasian watermilfoil and curlyleaf pondweed and where greater plant selectivity is desired, choose an application rate lower in the rate range.** For other plant species, SePRO recommends contacting an aquatic specialist in determining when to choose application rates lower in the rate range to meet specific plant management goals. For split or repeated applications, the sum of all applications must not exceed 150 ppb per annual growth cycle.

Note: In treating lakes or reservoirs that contain potable water intakes and the application requires treating within 1/4 mile of a potable water intake, no single application can exceed 20 ppb. Additionally, the sum of all applications cannot exceed 150 ppb per annual growth cycle.

B. Partial Lake or Reservoir Treatments

Where dilution of Sonar SRP with untreated water is anticipated, such as in partial lake or reservoir treatments, split or multiple applications may be used to extend the contact time to the target plants. The application rate and use frequency of Sonar SRP in a partial lake is highly dependent upon the treatment area. Higher application rates may be required and frequency of applications will vary depending upon the potential of untreated water

diluting the Sonar SRP concentration in the treatment area. Use higher rates where greater dilution with untreated water is anticipated.

1. Application Sites Greater Than 1/4 Mile from a Functioning Potable Water Intake

For single applications, apply Sonar SRP at application rates from 45 to 150 ppb. Split or multiple applications may be made, however, the sum of all applications cannot exceed 150 ppb per annual growth cycle. Split applications should be conducted to maintain a sufficient concentration in the target area for a period of 45 days or longer. The use of FasTEST is recommended to maintain the desired concentration in the target area over time.

2. Application Sites Within 1/4 Mile of a Functioning Potable Water Intake

In treatment areas that are within 1/4 mile of a potable water intake, no single application can exceed 20 ppb. When utilizing split or repeated applications of Sonar SRP for sites which contain a potable water intake, FasTEST is required to determine the actual concentration in the water. Additionally, the sum of all applications cannot exceed 150 ppb per annual growth cycle.

Application Rate Calculation - Ponds, Lakes and Reservoirs

The amount of Sonar SRP to be applied to provide the desired ppb concentration of active ingredient equivalents in treated water may be calculated as follows:

- Pounds of Sonar SRP required per treated acre = Average water depth of treatment site x Desired ppb concentration of active ingredient equivalents x 0.054

For example, the pounds per acre of Sonar SRP required to provide a concentration of 25 ppb of active ingredient equivalents in water with an average depth of 5 feet is calculated as follows:

$$5 \times 25 \times 0.054 = 6.75 \text{ pounds per treated surface acre.}$$

Note: Calculated rates should not exceed the maximum allowable rate in pounds per treated surface acre for the water depth listed in the application rate table for the site to be treated.

Application to Drainage Canals, Irrigation Canals and Rivers

Static Canals:

In static drainage and irrigation canals, Sonar SRP should be applied at the rate of 20 to 40 pounds per surface acre.

Moving Water Canals and Rivers:

The performance of Sonar SRP will be enhanced by restricting or reducing water flow. In slow moving bodies of water use an application technique that maintains a concentration of 10 to 40 ppb in the applied area for a minimum of 45 days. Sonar SRP can be applied by split or multiple broadcast applications or by metering in the product to provide a uniform concentration of the herbicide based upon the flow pattern. The use of FasTEST is recommended to maintain the desired concentration in the target area over time.

Static or Moving Water Canals or Rivers Containing a Functioning Potable Water Intake

In treating a static or moving water canal or river which contains a functioning potable water intake, applications of Sonar SRP greater than 20 ppb must be made more than 1/4 mile from a functioning potable water intake. Applications less than 20 ppb may be applied within 1/4 mile from a functioning potable water intake; however, if applications of Sonar SRP are made within 1/4 mile from a functioning water intake, the FasTEST must be utilized to demonstrate that concentrations do not exceed 150 ppb at the potable water intake.

Application Rate Calculation – Drainage Canals, Irrigation Canals and Rivers

The amount of Sonar SRP to be applied through a metering system to provide the desired ppb concentration of active ingredient in treated water may be calculated as follows:

1. Average flow rate (feet per second) x average width (ft.) x average depth (ft.) x 0.9 = CFS (cubic feet per second)
2. CFS x 1.98 = acre feet per day (water movement)
3. Acre feet per day x desired ppb x 0.054 = pounds Sonar SRP required per day

WARRANTY DISCLAIMER

SePRO Corporation warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. **SePRO Corporation makes no other express or implied warranty of merchantability or fitness for a particular purpose or any other express or implied warranty.**

INHERENT RISKS OF USE

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to the label instructions (including conditions noted on the label, such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, torna-

does, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of SePRO Corporation or the seller. All such risks shall be assumed by the buyer.

LIMITATION OF REMEDIES

The exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at SePRO Corporations election, one of the following:

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

SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such losses or damages in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

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

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Material Safety Data Sheet



Emergency Phone: 800-535-5053

General Phone: 1-317-580-8282

EPA Reg. Number: 67690-4

Effective Date: October 20, 2001

SONAR* SRP Herbicide

SePRO Corporation • Carmel, IN

1. PRODUCT AND COMPANY IDENTIFICATION:

PRODUCT: Sonar* SRP Herbicide

COMPANY IDENTIFICATION:

SePRO Corporation
11550 North Meridian Street, Suite 600
Carmel, IN 46032-4562

2. COMPOSITION/INFORMATION ON INGREDIENTS:

Fluridone: 1-Methyl-3-phenyl-CAS # 059756-60-4
(1H)-pyridinone (Fluridone)5%
5-(3-(Trifluoro-methyl)phenyl)-
4(1H)-Pyridinone
Inert Ingredients, Total, Including95%
Propylene GlycolCAS # 000057-55-6

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

3. HAZARDOUS IDENTIFICATIONS:

EMERGENCY OVERVIEW

Dark gray to dark brown pellet with a faint musty odor. May cause eye irritation. LD₅₀ for skin absorption in rabbits is >2000 mg/kg. Oral LD₅₀ for rats is >5000 mg/kg.
EMERGENCY PHONE NUMBER: 800-535-5053

POTENTIAL HEALTH EFFECTS: This section includes possible adverse effects, which could occur if this material is not handled in the recommended manner.

EYE: May cause slight eye irritation and/or slight transient (temporary) corneal injury.

SKIN: Essentially non-irritating to skin. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts.

The LD₅₀ for skin absorption in rabbits is >2000 mg/kg. Fluridone did not cause allergic skin reactions when tested in guinea pigs.

INGESTION: Single dose oral toxicity is extremely low. The oral LD₅₀ for rats is >5000 mg/kg. No hazards anticipated from swallowing small amounts incidental to normal handling operations.

INHALATION: Single exposure to dust is not likely to be hazardous. Dust may cause irritation to upper respiratory tract (nose and throat).

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Fluridone, in animals, has been shown to cause liver and kidney effects. Repeated excessive exposure to crystalline silica may cause silicosis, a progressive and disabling disease of the lungs. Some evidence suggests that kidney effects may result from excessive exposures also.

CANCER INFORMATION: Fluridone did not cause cancer in laboratory animals. This product contains clay that has naturally occurring crystalline silica as quartz. Crystalline silica is listed by IARC and NTP as a carcinogen for hazard communication purposes under OSHA Standard 29 CFR Part 1910.1200.7. Inhalation of excessive concentrations of any dust, including this material, may lead to lung injury.

TERATOLOGY (BIRTH DEFECTS): Fluridone did not cause birth defects; other fetal effects occurred only at doses toxic to the mother.

REPRODUCTIVE EFFECTS: Fluridone did not interfere with reproduction in animal studies.

4. FIRST AID:

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

SKIN: 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.

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

INHALATION: Move person to fresh air. If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably by mouth to mouth. Call a poison control center or doctor for further treatment advice.

NOTE TO PHYSICIAN: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES:

FLASH POINT: Not applicable

METHOD USED: Not applicable

FLAMMABLE LIMITS:

LFL: Not applicable

UFL: Not applicable

AUTO-IGNITION TEMPERATURE: No ignition up to 1382°F (750°C)

EXTINGUISHING MEDIA: Use water, CO₂, or dry chemicals.

FIRE AND EXPLOSION HAZARDS: Will emit toxic vapors as it burns.

FIREFIGHTING EQUIPMENT: Wear positive-pressure, self-contained breathing apparatus and full protective clothing.

6. ACCIDENTAL RELEASE MEASURES:

ACTION TO TAKE FOR SPILLS AND LEAKS:

Contain and sweep up small spills and dispose as waste. Report large spills to CHEMTREC and consult SePRO Corporation for assistance. Prevent runoff.

7. HANDLING AND STORAGE:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Keep out of reach of children. Harmful if swallowed, absorbed through the skin, or inhaled. Avoid breathing dust or contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Wash exposed clothing before reuse.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

These precautions are suggested for conditions where the potential for exposure exists. Emergency conditions may require additional precautions.

EXPOSURE GUIDELINES: Crystalline silica: ACGIH TLV is 0.05 mg/M³ for quartz, tripoli, and fused silica; 0.05 mg/M³ (respirable) for cristobalite and tridymite. OSHA PEL is 10/%SiO₂ + 2 mg/M³ (respirable) for quartz, tripoli, and fused silica; 1/2 the value calculated from the respirable dust formula for quartz for cristobalite and tridymite.

PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guidelines. In dusty atmospheres, use a NIOSH approved dust respirator.

SKIN PROTECTION: Use gloves impervious to this material.

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SePRO Corporation • Carmel, IN

EYE/FACE PROTECTION: Use safety glasses.

APPLICATORS AND ALL OTHER HANDLERS:
Refer to the product label for personal protective clothing and equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES:

SOLUBILITY IN WATER: Insoluble (disintegrates in water)

APPEARANCE: Dark gray or dark brown pellet

ODOR: Faint musty

pH: (aqueous 50/50) 3.5

10. STABILITY AND REACTIVITY:

STABILITY: Stable under normal storage conditions.

INCOMPATIBILITY: (Specific materials to avoid) Not determined.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION:

MUTAGENICITY: For fluridone, in-vitro mutagenicity studies were predominantly negative and animal mutagenicity studies were negative.

12. ECOLOGICAL INFORMATION:

Follow label use directions carefully so as to avoid adverse effects on non-target organisms. In order to avoid impact on threatened or endangered aquatic plant or animal species, users must consult their state fish and game agency or the U.S. Fire and wildlife Service before making applications. Do not contaminate water when disposing of equipment wash waters. Trees and shrubs growing in water treated with Sonar SRP may be injured. Do not apply in tidewater or brackish waters.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL: Do not contaminate water, food, or feed

by storage or disposal. Wastes resulting from the use of this product may be disposed of on site per label use directions or at an approved waste disposal facility. Follow all local, state, and federal requirements for disposal.

14. TRANSPORT INFORMATION

For DOT regulatory information, if required, consult transportation regulations, product shipping papers, or your SePRO Corporation representative.

15. REGULATORY INFORMATION:

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

U.S. REGULATIONS

SARA TITLE III, SECTION 313: To the best of our knowledge, this product contains no chemical subject to SARA Title III, Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An Immediate Health Hazard
A Delayed Health Hazard

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 701): (4=Extreme; 3=High; 2=Moderate; 0=Insignificant)

Health	1
Flammability	0
Reactivity:	0

Material Safety Data Sheet



Emergency Phone: 800-535-5053

General Phone: 1-317-580-8282

EPA Reg. Number: 67690-4

Effective Date: October 20, 2001

SONAR* SRP Herbicide

SePRO Corporation • Carmel, IN

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in Section 1 of the MSDS.

Chemical Name	CAS Number	List
Crystalline Silica	001332-58-7	NJ3, PA1

NJ3=New Jersey Workplace Hazardous Substance (present at \geq to 1.0%).

PA1=Pennsylvania Hazardous Substance (present at \geq to 1.0%).

TOXIC SUBSTANCES CONTROL ACT (TSCA): All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

OSHA HAZARD COMMUNICATION STANDARD: This product is a "hazardous Chemical" as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

16. OTHER INFORMATION:

MSDS STATUS: Revised Sections: 3 & 8
Reference: DR-0336-1679
Replaces MSDS Dated: 7/1/98

The Information Herein Is Given In Good Faith, But No Warranty, Express or Implied, Is Made. Consult SePRO Corporation for Further Information.



Appendix D

**USFW Letter
May 3, 2002**



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

IN REPLY REFER TO:
1-1-02-F-158

May 3, 2002

Dr. Lars W. J. Anderson, Lead Scientist
United States Department of Agriculture
Agricultural Research Service
Weed Science Program
University of California
One Shields Avenue
Davis, California 95616

Subject: Reinitiation of Formal Consultation on the *Egeria densa* Control Program in the Sacramento-San Joaquin Delta in Four Counties, California (Service File No. 1-1-00-F-234)

Dear Dr. Anderson:

This is in response to three letters which were discussed in our meeting on March 15, 2002. First, the February 22, 2002, letter from the California Department of Boating and Waterways (DBW) requesting the U.S. Fish and Wildlife Service (Service) approve the addition of a newly registered fluridone product, Sonar PR, to the *Egeria densa* Control Program. The DBW letter was received in our office on February 26, 2002. Second, your March 20, 2002, letter requesting the Service amend the June 1, 2001, biological opinion for the *Egeria densa* Control Program (Service file no. 1-1-00-F-234) to (1) establish a program start date earlier than the existing June 1 date, and (2) permit the use of a surrogate species for toxicity tests due to unavailability of the threatened Sacramento splittail (*Pogonichthys macrolepidotus*). Your letter was received in our office on March 21, 2002. Third, the April 10, 2002, letter from the California Department of Fish and Game (DFG) requesting the Service amend the June 1, 2001, biological opinion for the *Egeria densa* Control Program (Service file no. 1-1-01-F-50) to permit the capture of 1,400 larval and juvenile Sacramento splittail to test the toxic effects of herbicides and adjuvants used in the *Egeria densa* Control Program. The DFG letter was received in our office on April 11, 2002. Our biological opinion addressed potential effects of the proposed project on the federally threatened Sacramento splittail, giant garter snake (*Thamnophis gigas*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), and delta smelt (*Hypomesus*

transpacificus) and its designated critical habitat, in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

We have reviewed the available information on the fluridone product, Sonar PR, and determined that it has the same effects as Sonar AS and Sonar SRP. Therefore it is likely that the level of incidental take that would occur from the use of Sonar PR in place of Sonar AS and Sonar SRP would not exceed that which would occur from the original biological opinion. The Service hereby amends the biological opinion to permit the substitution of Sonar PR in place of Sonar AS and Sonar SRP as determined by DBW for each treatment site on an annual basis, and to include Sonar PR in all of the research trials.

Due to the inability of the DBW to locate a supplier for larval and juvenile Sacramento splittail in 2001, they were unable to conduct all of the research trials. Because these studies have not been completed, no new data have been developed on the effects of the *Egeria densa* Control Program on Sacramento splittail to support any modifications to the program start dates. Therefore, the Service has determined that it is premature to consider any modifications to the periods of chemical treatment specified in the biological opinion based upon chemical toxicity or other effects of the *Egeria densa* Control Program.

The Service has determined that the use of a surrogate species for Sacramento splittail is unacceptable. While there are abundant non-native cyprinids available (fathead minnows [*Pimephales promelas*] and golden shiners [*Notemigonus crysoleucas*]), the splittail is behaviorally unlike these non-native fishes and most likely physiologically distinct from them as well. Further, potential surrogate native cyprinids (hardhead [*Mylopharodon conocephalus*], blackfish [*Orthodon microlepidotus*], pikeminnow [*Ptychocheilus grandis*]) are piscivorous when adults, and also likely physiologically distinct from splittail. Splittail may have its closest relative in the *Rhinichthys* complex (speckled dace [*Rhinichthys osculus*] and others) but use of these diminutive, short-lived, small-stream species would be similarly inadvisable. Lastly, the Service would have serious concerns with results obtained from surrogate species, as wide variation in contaminant effects thresholds have been noted in otherwise similar species. Therefore the Service would be forced to apply these uncertainties to any results noted for surrogates, making the data no more applicable than what currently exist.

The Service hereby amends the biological opinion to permit the capture of 1,400 larval and juvenile Sacramento splittail to test the toxic effects of herbicides and adjuvants used in the *Egeria densa* Control Program.

F

All terms and conditions in the biological opinion remain as stated except for 1(h), which has been added to the biological opinion as follows:

- h. DFG is authorized to capture up to 1,400 larval and juvenile Sacramento splittail to test the toxic effects of herbicides and adjuvants used in the *Egeria densa* Control Program. The capture and handling of Sacramento splittail shall only be done by Service-approved biologists.

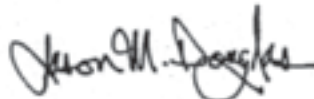
Dr. Lars W. J. Anderson, Lead Scientist

3

This concludes formal consultation with United States Department of Agriculture's Agricultural Research Service on the actions outlined in your amendment request for the *Egeria densa* Control Program. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the proposed action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (4) a new species or critical habitat is designated that may be affected by the proposed action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

If you have any questions regarding this response, please contact Mike Nepstad or Dan Buford at (916) 414-6625.

Sincerely,



 Cay C. Goude
Acting Field Supervisor

cc:

ARD-ES, Portland, OR

National Marine Fisheries Service, Sacramento, CA, (Attn: Jeffery S. Stuart)

California Department of Boating and Waterways, Sacramento, CA, (Attn: Marcia Carlock)

California Department of Boating and Waterways, Sacramento, CA, (Attn: Donald Waltz)

California Department of Fish and Game, Sacramento, CA, (Attn: John Turner)



Appendix E

**USFW Letter
January 23, 2002**



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

IN REPLY REFER TO:
1-1-03-F-0061

January 23, 2003

Dr. Lars W. J. Anderson
Lead Scientist
United States Department of Agriculture
Agricultural Research Service
Weed Science Program
University of California
One Shields Avenue
Davis, California 95616

Subject: Reinitiation of Formal Consultation on the *Egeria densa* Control Program in the Sacramento-San Joaquin Delta in Four Counties, California (Service File No. 1-1-00-F-234)

Dear Mr. Anderson:

This is in response to your letter dated January 8, 2003, requesting the Service amend the June 1, 2001, biological opinion for the *Egeria densa* Control Program (Service file no. 1-1-01-F-50) to add a management option of using Sonar Precision Release pellets (active ingredient is Fluridone) in sites that presently have the management option of using Diquat only. Your letter was received in our office on January 10, 2003. Our biological opinion addressed potential effects of the proposed project on the federally threatened Sacramento splittail, giant garter snake (*Thamnophis gigas*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), and delta smelt (*Hypomesus transpacificus*) and its designated critical habitat, in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

The California Department of Boating and Waterways (DBW) would like to add a management option of using Sonar Precision Release pellets in sites that presently have the management option of using Diquat only. It is now possible to use Fluridone in these locations because Sonar Precision Release pellets performs better in flowing waters than previous formulations. They would not be adding any new treatment sites. In some cases, Sonar Precision Release pellets would be used sequentially after an initial treatment of Diquat in lieu of a second application of Diquat. In these cases, chemical residue analysis will be conducted to insure that Diquat has dissipated to pre-application levels before any subsequent use of Fluridone.

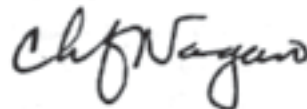
We have reviewed the available information on the Sonar Precision Release pellets, and determined that it is less toxic than Diquat. Therefore it is likely that the level of incidental take that would occur from the use of the Sonar Precision Release pellets in place of Diquat would not exceed that which would occur from the original biological opinion. The Service hereby amends the biological opinion to permit the substitution of Sonar Precision Release pellets in place of Diquat as determined by the DBW for each treatment site on an annual basis.


The remainder of the project description, baseline, effects, conclusion, incidental take, reasonable and prudent measures, and conservation measures, as described in June 1, 2001, biological opinion for the *Egeria densa* Control Program (Service file no. 1-1-01-F-50) remain the same.

This concludes formal consultation with United States Department of Agriculture's Agricultural Research Service on the actions outlined in your amendment request for the *Egeria densa* Control Program. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the proposed action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (4) a new species or critical habitat is designated that may be affected by the proposed action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

If you have any questions regarding this response on *Egeria densa* control program, please contact Mike Nepstad or Dan Buford at (916) 414-6625.

Sincerely,



 Cay Goude
Acting Field Supervisor

cc:

ARD-ES, Portland, OR

National Marine Fisheries Service, Sacramento, CA, (Attn: Jeffery S. Stuart)

California Department of Boating and Waterways, Sacramento, CA, (Attn: Marcia Carlock)

California Department of Boating and Waterways, Sacramento, CA, (Attn: Donald Waltz)

California Department of Fish and Game, Sacramento, CA, (Attn: John Turner)



Appendix F

Environmental Impacts of the EDCP (Listed by Resource Category)

**Environmental Impacts of the EDCP
(Listed by General Resource Category)**

No.	Resource Categories	Impact Significance Prior to Mitigation	Explanation of Impact	Proposed Mitigation Measures	Impact Significance Post Mitigation
1	Hydrology and Water Quality				
	General Water Quality				
	Toxicity	Unavoidable Significant Impact	Reward and Sonar use conflict with the Basin Plan standards regarding toxicity, which state that Delta waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.	No mitigation available	Unavoidable Significant Impact
	Dissolved Oxygen (DO)	Avoidable Significant Impact	Reward use could result in a short-term, localized reduction in DO to concentrations that are less than the numeric standards specified in the Basin Plan.	Prior to any herbicide treatment, the DBW would measure DO concentration at treatment site. If concentrations were less than 5 ppm, treatment would be postponed until levels increased above this limit. The DBW would treat no more than 20 acres per day at a given treatment site. During late summer and fall (when DO in the hypolimnion is typically lowest), no more than 20 acres would be treated at a given treatment site over a 14-day period.	Less than Significant Impact
	Sediments	Less than Significant Impact	Reward is not biologically available once it reaches the sediments and will degrade over time.	No mitigation necessary.	Less than Significant Impact
	Turbidity	Unavoidable Significant Impact	Mechanical harvester maneuvering can cause temporary localized increases in turbidity.	No mitigation available.	Unavoidable Significant Impact
	Floating Material	Avoidable Significant Impact	Plant fragments generated during mechanical harvesting can become a nuisance if a substantial quantity of fragments remain uncollected.	A fragment collection vessel would follow each mechanical harvester operating at a treatment site. The DBW would not conduct harvesting on extremely windy days.	Less than Significant Impact
	Drinking Water Quality				
	Chemical Constituents	Avoidable Significant Impact	Reward treatments that occur near water treatment facility intakes could adversely impact drinking water supplies if an influx of herbicide-treated water contaminated drinking water supplies.	At least, two weeks prior to treatments, the DBW would contact appropriate drinking water utilities and the CA Department of Health Services to inform them that treatment is to occur. The DBW would establish a one mile buffer zone around water treatment facility intakes within which herbicide application would not occur without consultation and agreement from the water agency. If required, in addition to regular monitoring activities (measurements of DO, herbicide residues, turbidity, etc.), the DBW would consult with the DHS to coordinate monitoring of BOD, TOC, DOC, and UVA-254 as necessary.	Less than Significant Impact
	Trihalomethane Formulation	Avoidable Significant Impact	Herbicide treatments that occur near water treatment facility intakes could increase the potential for THM formation due to the increase in dissolved organic compounds released from decaying plant material.	Same as for Drinking Water Quality-Chemical Constituents above.	Less than Significant Impact
Turbidity	Avoidable Significant Impact	Mechanical harvesting near water treatment plant intakes could temporarily increase turbidity levels.	Same as for Drinking Water Quality-Chemical Constituents above.	Less than Significant Impact	

Changes from original 2001 EIR noted in bold

**Environmental Impacts of the EDCP
 (Listed by General Resource Category)**

No.	Resource Categories	Impact Significance Prior to Mitigation	Explanation of Impact	Proposed Mitigation Measures	Impact Significance Post Mitigation
2	Biological Resources				
	Plants				
	Native Aquatic Plants and Algae	Less than Significant Impact	Loss of native aquatic plants would be minimal since treatment is focused on sites with a high relative abundance (approximately 85 percent) of Egeria. Further, removal of Egeria would create new habitat for native aquatic plants. Algae would not be impacted by Sonar treatments or mechanical harvesting. Treatment with Reward may result in short-term, localized decreases in algal abundance. However, algal abundance would be expected to rebound rapidly due to redistribution of algal cells by water flow. Further, increases in light penetration in the water column following removal of Egeria would facilitate algal growth.	No mitigation necessary.	Less than Significant Impact
	Intertidal Wetland Plant Communities	Unavoidable Significant Impact	Wetland and special status Intertidal plants could be adversely impacted or killed due to inundation by herbicides or staging of mechanical harvesting equipment. These special status plants include Mason's lilaepsis, Delta mudwort, Rose mallow, Delta tule pea, and Northern California black walnut. Wetland plants include tules and cattails.	Prior to an herbicide application, channel banks would be surveyed by a qualified botanist to determine whether sensitive plant species are present. If the site has a high percentage of sensitive plants, the site may not be treated. If possible, herbicide applications would occur during low tide to decrease the likelihood that sensitive plants would be inundated by herbicide-treated water. Herbicide applications would focus on the mid-channel region to decrease the possibility that concentrated herbicides would come in contact with sensitive plants growing along channel banks. Following herbicide treatment, channel banks would be surveyed to determine whether a loss of sensitive plants has occurred. If substantial loss is evident, changes would be made to the treatment protocol. Prior to mechanical harvesting, channel banks would be surveyed. The area around any sensitive plants would be flagged and no staging, or movement of harvester equipment, would be allowed within the flagged area.	Unavoidable Significant Impact
Terrestrial Plants	No impact	Project operations would not affect plants that occur upland of channel banks. Further, disposal of harvested Egeria would occur on fallow agricultural land, and thus would not impact any sensitive plant species.	No mitigation necessary.	No impact	

Changes from original 2001 EIR noted in bold

**Environmental Impacts of the EDCP
(Listed by General Resource Category)**

No.	Resource Categories	Impact Significance Prior to Mitigation	Explanation of Impact	Proposed Mitigation Measures	Impact Significance Post Mitigation
	Invertebrates				
	Aquatic Invertebrates	Unavoidable Significant Impact	Reward and mechanical harvesting could cause a temporary decrease in the abundance of invertebrates. Reward is moderately toxic to aquatic invertebrates and mechanical harvesting can result in their removal and physical destruction. The decrease in invertebrate abundance would likely be temporary. It is expected that planktonic invertebrates would be reintroduced to treatment areas inadvertently through water flow. Further, benthic and plant-dwelling organisms likely would recolonize treatment areas relatively rapidly once regrowth of plants began.	No more than 20 acres would be treated with Reward on any given day in a given treatment site. For treatment sites larger than 20 acres, upstream portions would be treated first, and downstream portions would be treated at least 14 days later. Mechanical harvesting sites would be no larger than 10 acres in size. Harvesters would not cut vegetation more than five feet below water level, thus leaving one to three feet of standing vegetation. These measures would decrease the overall loss of invertebrates and would minimize impediments to recolonization. No sequential treatment of Sonar Precision Release following Reward would occur if detectable levels of Reward are measured. Chemical residue sampling would continue following a Reward application until confirmation of non-detectable levels.	Unavoidable Significant Impact
	Insects	Avoidable Significant Impact	EDCP operations could harm the Valley elderberry longhorn beetles if project operations adversely impacted elderberry shrubs.	Prior to treatment, surveys would be conducted to determine whether sensitive species are present. EDCP treatments would not occur along channel bluffs where elderberry shrubs could be adversely impacted.	Less Than Significant Impact
	Fish				
	Fish: Direct Impacts	Unavoidable Significant Impact	Mechanical harvesting can result in the removal and physical destruction of fish present in Egeria beds. Special status species that could be impacted include all four runs of chinook salmon, steelhead, delta smelt, splittail, green sturgeon, longfin smelt, and Pacific River lamprey. Reward and Sonar use would have no direct adverse impacts on fish.	All requirements identified by the regulatory agencies, such as the USFWS, NMFS, and CDFG, would be adhered to. These could involve, for example, suspension of harvesting operation for specific periods of time to avoid disrupting fish migration or spawning, or avoiding certain habitat conditions. Prior to mechanical harvesting, IEP Real Time Monitoring data would be obtained and evaluated (if available and relevant to the project site) to determine whether any sensitive fish species had been identified in the treatment area. If required by regulatory agencies, a pretreatment fish survey following the protocol for pop-net use established by McGowan (1998) would be conducted by a qualified biologist one to two days prior to commencement of treatment. If the number of special status fish identified through IEP data or pop-net surveys were above a certain threshold level, treatment would be postponed until additional surveys indicated fewer sensitive fish were present in the area. The threshold level would be established through consultation with the appropriate regulatory agencies.	Unavoidable Significant Impact

Changes from original 2001 EIR noted in bold

**Environmental Impacts of the EDCP
 (Listed by General Resource Category)**

No.	Resource Categories	Impact Significance Prior to Mitigation	Explanation of Impact	Proposed Mitigation Measures	Impact Significance Post Mitigation
	Fish: Direct Impacts <i>(continued)</i>			<p>For the first two years of the EDCP, a representative sample of the harvested material would be examined by a qualified biologist to assess any incidental taking of threatened, endangered or special status species. This information would be reported to the appropriate regulatory agencies and adjustments to program protocol could be made in order to minimize impacts.</p> <p>No sequential treatment of Sonar Precision Release following Reward would occur if detectable levels of Reward are measured. Chemical residue sampling would continue following a Reward application until confirmation of non-detectable levels.</p>	
	Indirect Impacts to Fish: Habitat	Avoidable Significant Impact	Reward use could result in a short-term, localized reduction in DO to concentrations that could adversely impact the habitat of the special status fish species listed above. Loss of native vegetation due to EDCP project activities would be a less than significant impact, since treatments would focus on sites with a high relative abundance of <i>Egeria</i> .	Same as for General Water Quality - Dissolved Oxygen above.	Less than Significant Impact
	Indirect Impacts to Fish: Prey Base	Unavoidable Significant Impact	Reward use and mechanical harvesting could cause a temporary decrease in the abundance of aquatic invertebrates, which could adversely impact special status fish species such as chinook salmon, delta smelt and splittail that consume these invertebrates.	Same as for Biological Resources—Invertebrates above.	Unavoidable Significant Impact
	Wildlife Reptiles and Amphibians	Unavoidable Significant Impact	Reward and Sonar use could adversely impact reptiles and amphibians that utilize channels and channel banks in the Delta, including special status species such as the giant garter snake, western pond turtle, and red-legged frog. Mechanical harvesting operations and staging of equipment could kill or maim individuals in channels or on channel banks.	Prior to mechanical harvesting, channel banks and uplands adjacent to treatment sites would be surveyed by a qualified biologist to assess whether sensitive species are present. Areas which show presence of sensitive species (e.g., nests or burrows) or which exhibit ideal habitat conditions for a particular sensitive species would be flagged. No mechanical harvesting equipment would be allowed within 50 feet of these flagged areas. There is no mitigation for impacts to reptiles and amphibians resulting from Reward and Sonar.	Unavoidable Significant Impact

Changes from original 2001 EIR noted in bold

**Environmental Impacts of the EDCP
(Listed by General Resource Category)**

No.	Resource Categories	Impact Significance Prior to Mitigation	Explanation of Impact	Proposed Mitigation Measures	Impact Significance Post Mitigation
	Birds	Unavoidable Significant Impacts	Reward or Sonar use could adversely impact birds that nest or forage on channel banks, since the herbicide could kill channel bank vegetation. Mechanical harvesting could adversely impact birds that nest or forage along channel banks due to staging of mechanical harvesting equipment. Special status species that could be impacted include the California black rail and great blue heron.	Same as for Biological Resources– Plants (Wetland, Intertidal and Riparian Plant Communities, and Wildlife - Reptiles and Amphibians).	Unavoidable Significant Impacts
	Mammals	Less Than Significant Impact	Exposure of mammals to EDCP activities is expected to be minimal. The only special status mammal species that utilize sloughs and channels of the Delta are the Small-footed myotis bat and Yuma myotis bat, which forage over the water. However, they are not expected to be impacted because EDCP activities would not affect their insect prey.	No mitigation necessary.	Less Than Significant Impact
3	Agricultural Resources				
	Agricultural Operations, Irrigation	Avoidable Significant Impact	Reward and Sonar use could adversely impact crops if herbicide-treated water were used for irrigation. Mechanical harvesting could disrupt irrigation if plant fragments clogged irrigation intakes.	Prior to beginning EDCP treatments (herbicide or mechanical) that are to occur near agricultural intakes, the appropriate County Agricultural Commissioner's Office would be consulted. Local landowners could then be informed of the particular periods of time during which irrigation should not occur and when it is safe to begin irrigation. Post-treatment monitoring would include measurement of herbicide residues in the water column and a site check for Egeria fragments in intake pipes.	Less Than Significant Impact
4	Utilities and Service Systems				
	Public Water Supply Operations	Avoidable Significant Impact	An increase in debris load due to decaying plant material, or plant fragments could adversely impact public water supply operations by clogging intake screens or pumps.	The DBW would establish a one-mile buffer zone around water treatment intakes. No herbicide application or mechanical harvesting would occur within that buffer zone without consultation and agreement from the appropriate water agencies.	Less Than Significant Impact

Changes from original 2001 EIR noted in bold

**Environmental Impacts of the EDCP
 (Listed by General Resource Category)**

No.	Resource Categories	Impact Significance Prior to Mitigation	Explanation of Impact	Proposed Mitigation Measures	Impact Significance Post Mitigation
5	Hazardous and Hazardous Materials				
	Human Health	Avoidable Significant Impact	Reward use could adversely impact drinking water supplies as described above under Drinking Water Quality-Chemical Constituents. Impacts to human health could also result from exposure to concentrated formulations of reward and Sonar.	Impacts to drinking water supplies would be avoided through mitigation measures described above under Drinking Water Quality-Chemical Constituents. Prior to treatments, marina and dock owners would be notified regarding timing of treatments. During herbicide treatments, sites would be marked with buoys. Additionally, DBW staff would patrol treatment areas on a support boat, informing recreators that treatments are occurring. Handling of concentrated chemicals would follow the protocol identified in "Herbicide Handling Procedures and Spill Contingency Plan" (Appendix S).	Less Than Significant Impact
	Catastrophic Spills	Avoidable Significant Impact	A catastrophic spill of Reward or Sonar could result in adverse impacts to aquatic, wetland and intertidal habitat and associated flora and fauna, including special status species. Adverse impacts to human health could occur also due to exposure to concentrated herbicide formulations. The degree of harm would depend on the amount of chemical spilled, environmental conditions (flow, tidal action), and emergency response time.	Avoidance and mitigation measures are contained in "Herbicide Handling Procedures and Spill Contingency Plan" (Appendix S).	Less Than Significant Impact

Changes from original 2001 EIR noted in bold



Appendix G

**Delta Sequential Reward
(Diquat) and Sonar Precision
Release Treatment Test Results**

C-1: Application Information Associated with Monitored Sites

Site 173, Franks Tract

Date	Disrupt (gal)	Disrupt Acres	Fluridone (pellets lbs.)	Fluridone (liquid gal.)
08/01/02	60.0	20	0.0	0.0
08/13/02	0	0	180.0	0.0
08/20/02	0	0	180.0	0.0
08/28/02	0	0	180.0	0.0
09/03/02	0	0	180.0	0.0
09/10/02	0	0	180.0	0.0
09/17/02	0	0	180.0	0.0
09/23/02	0	0	180.0	0.0
10/01/02	0	0	180.0	0.0
Total:	60.0	20.0	1260.0	0.0

16 Acres Treated

Site 15, Little Venice Island

Date	Disrupt (gal)	Disrupt Acres	Fluridone (pellets lbs.)	Fluridone (liquid gal.)
08/01/02	60	20	0.0	0.0
08/07/02	0	0	962.0	0.0
08/13/02	0	0	962.0	0.0
08/20/02	0	0	962.0	0.0
08/27/02	0	0	636.4	0.0
09/03/02	0	0	636.4	0.0
09/10/02	0	0	636.4	0.0
09/17/02	0	0	636.4	0.0
09/24/02	0	0	636.4	0.0
Total:	60.0	20.0	6068.0	0.0

74 Acres Treated

Figure C-2: 2002 Fluridone Residue Concentrations: Tidal

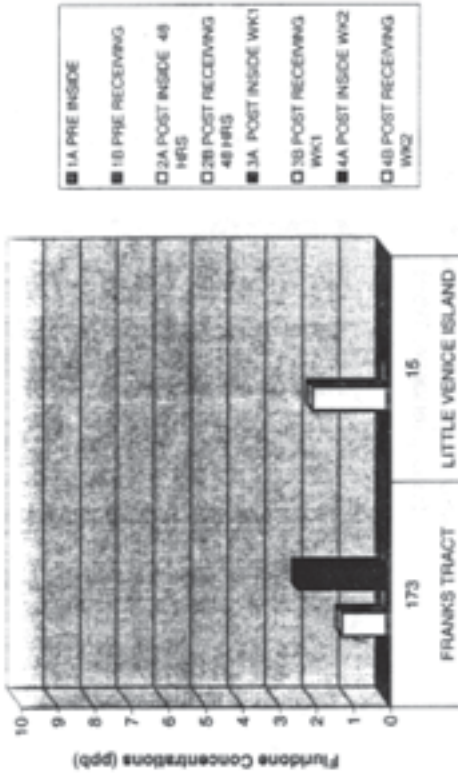


Figure C-3: 2002 *Selenastrum capricornutum* 96-hr. Growth Test (Fluridone: Tidal)

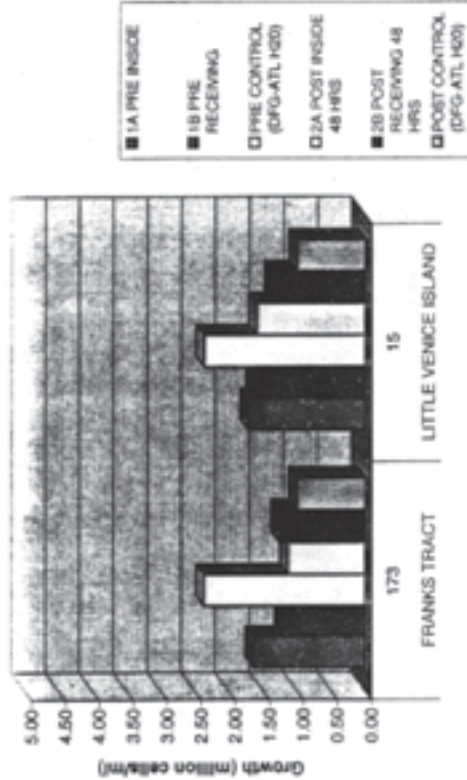


Figure C-4: 2002 *Ceriodaphnia dubia* 96-hr. & 7-day Toxicity Tests (Fluridone: Tidal)

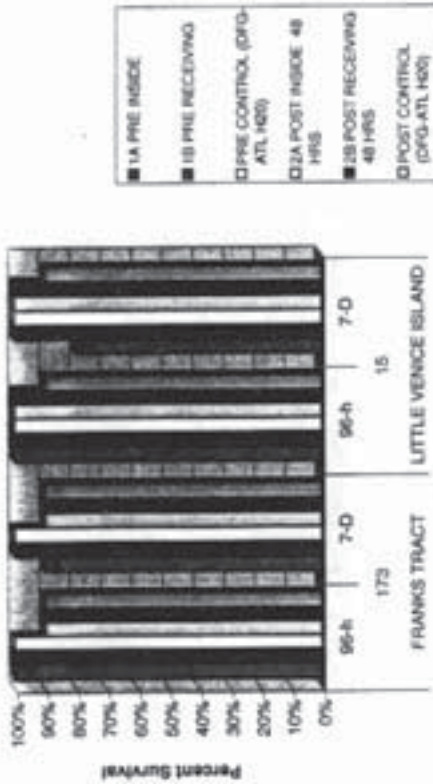


Figure C-5: 2002 *Ceriodaphnia dubia* 7-day Chronic Toxicity Test-Progeny (Fluridone: Tidal)

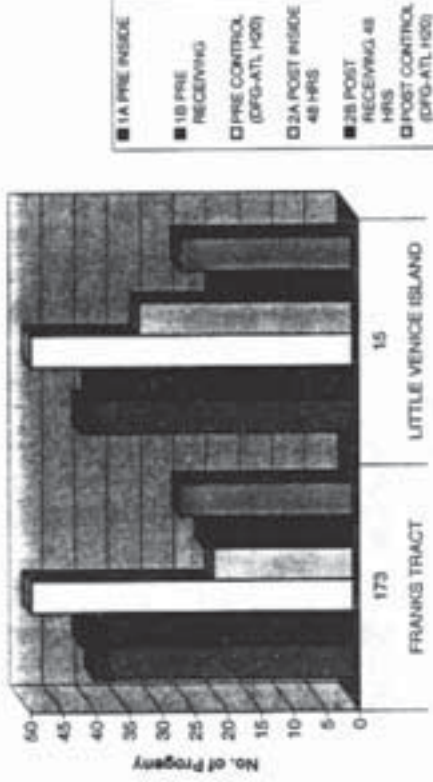


Figure C-6: 2002 *Pimephales promelas* 96-hr. & 7-day Toxicity Tests (Fluridone: Tidal)

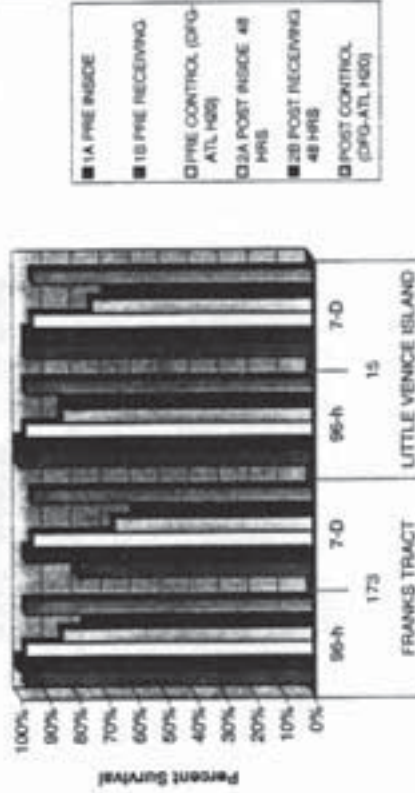


Figure C-7: 2002 *Pimephales promelas* 7-day Chronic Toxicity Test-Growth (Fluridone: Tidal)

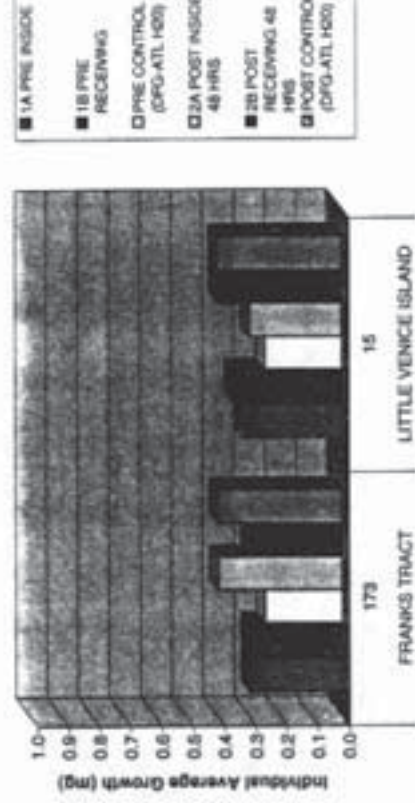


Figure C-8: Site 173-Franks Tract
2002-Dissolved Oxygen Readings
(Environmental Data)

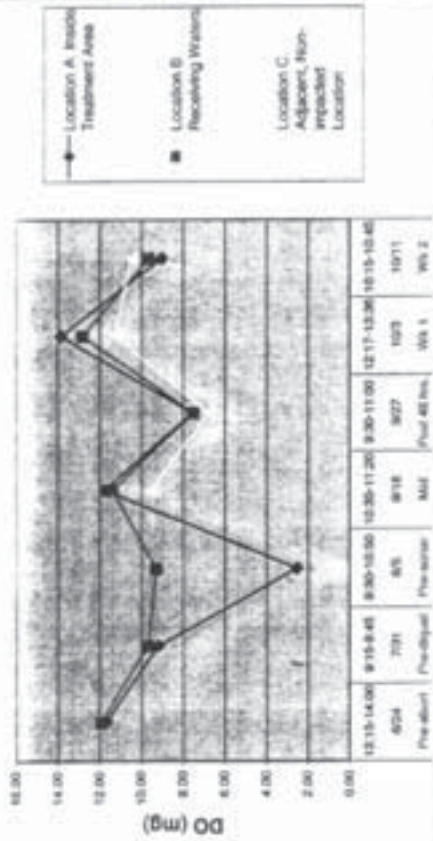


Figure C-9: Site 15-Little Venice Island
2002-Data Dissolved Oxygen Readings
(Environmental Data)

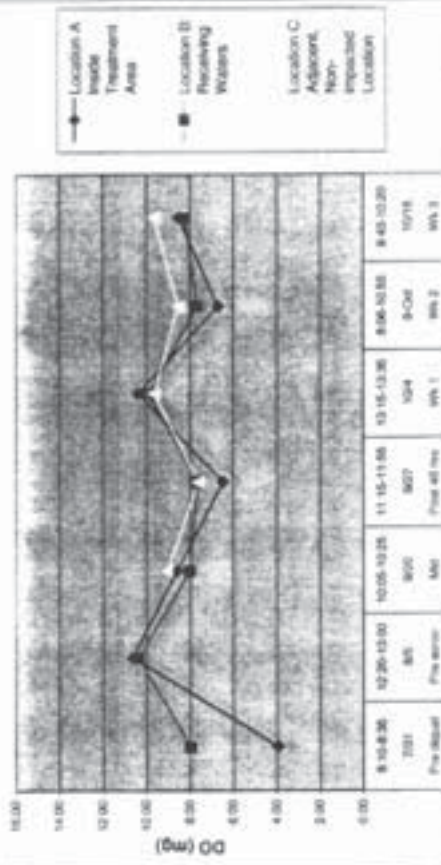


Figure C-10: Site 173 Franks Tract
2002-pH Readings

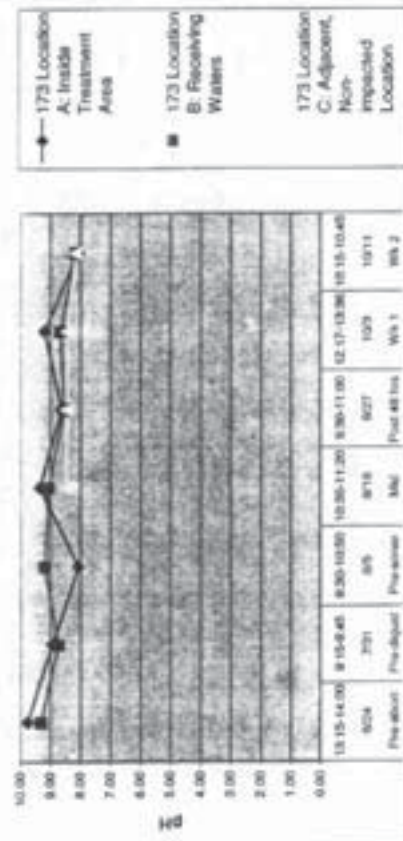


Figure C-11: Site 15 Little Venice Island
2002-pH Readings

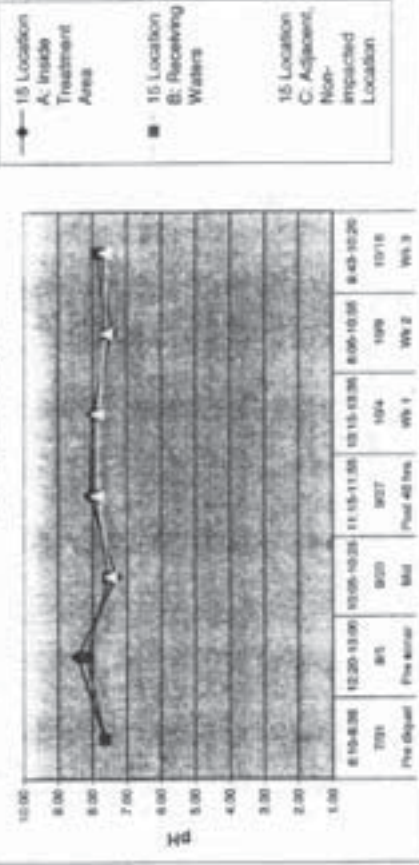


Figure C-12: Site 173 Franks Tract
2002-Turbidity Readings

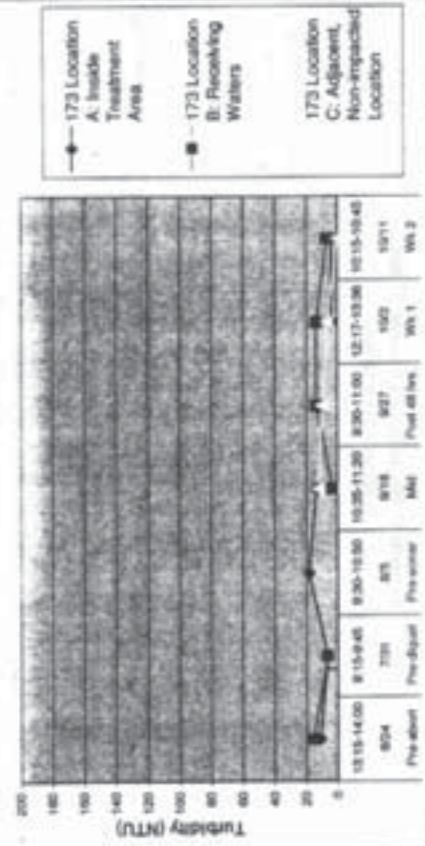
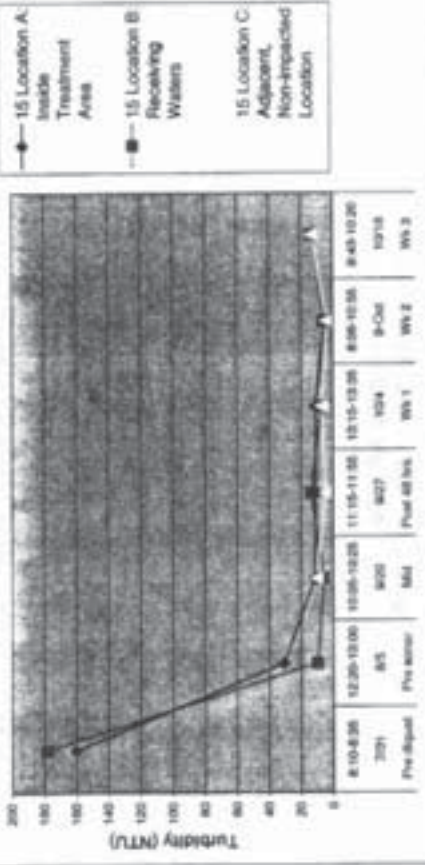


Figure C-13: Site 15 Little Venice Island
2002-Turbidity Readings





Appendix H

DBW Write-up of Sequential Reward (Diquat) and Sonar Treatments

3.3.4.2 Sequential Applications of Diquat and Fluridone

3.3.4.2.1 Application Details

The DBW treated two sites sequentially with diquat and then fluridone in the 2002 season. The two sites where sequential applications occurred were Site 173 Franks Tract and Site 15 Little Venice. This management approach was not applied in the 2001 season and not designated in most of the 35 priority locations in the EDCP EIR. In the EDCP EIR most of the 35 priority locations are designated as diquat treatment options. Those locations with less water flow-through had been designated as fluridone treatment sites. A few locations were designated with both the diquat and fluridone management options. See Appendix H, Item # 3.

The EDCP also switched from Sonar SRP to Sonar Precision Release.⁴⁸ Both are granular formulations of fluridone; however, the release mechanism of Sonar Precision Release has improved the performance of fluridone in waters with more flow-through. This expands management options in sites currently designated for diquat only. The DBW will be submitting an Addendum to the EIR to formalize the minor change to project description.

The preferred choice would be to switch from diquat to fluridone whenever that solution would be most effective. However, when using fluridone, late start dates present a major challenge to achieving high efficacy. Thus, until the NOAA Fisheries start date is moved from June 1 to April 1 other solutions must be sought out.⁴⁹

Fluridone, as has been noted in the EIR and permitting documents, is a systemic herbicide that is absorbed through foliage and roots. It inhibits carotenoid synthesis, a process most active in new growth. In the absence of carotene (yellow pigments), chlorophyll is rapidly degraded by sunlight. Plants are unable to produce carbohydrates as a result and starve to death over time, usually between 45-90 days. Thus, early treatments, when plants are in an active growth phase, are most effective.

However, the EDCP program has had to contend with later application start dates than anticipated in the EDCP EIR due to Section 7/ Endangered Species requirements. Instead of start dates in the spring at the beginning of *Egeria densa's* active growth phase, the EDCP has not been permitted to begin treatments until mid summer. This has posed a management challenge in terms of achieving efficacy and minimizing impacts.

⁴⁸ This change was approved by all permitting agencies and shall be formalized in the Addendum to the EDCP EIR.

⁴⁹ Currently testing, per agreed upon protocols, *Early Life –Stage Toxicity of Fluridone to the Chinook Salmon and Seawater Challenge Tests to Measure Seawater Adaptability of Juvenile Chinook Salmon—Exposed to Fluridone*, are being conducted. NOAA Fisheries has informed the DBW that it will not change the start date until such data has been submitted and reviewed by their biologists. It is estimated that preliminary reports will be available by March 1.

The decided upon solution, was to apply a contact herbicide to the target species first. This has shown efficacy in other similar situations.⁵⁰ Defoliated *Egeria densa*, as a perennial, will begin to produce new growth to compensate for damaged foliage. The contact herbicide diquat is the only other chemical the EDCP is currently permitted to use.

Diquat label requirements allow up to two treatments in a treatment polygon if fish toxicity protocols are followed. Additional treatments may occur in the same site but not in the same treatment polygon. Since diquat is a contact herbicide that damages only the vegetation it touches and *Egeria densa* has usually reached the water surface and created a dense subsurface biomass by July 1, sequential treatments are often necessary to open waterways. However, for a number of reasons, the efficacy of diquat is limited.⁵¹ Also diquat, though a low to moderately toxic chemical, is more toxic than fluridone.⁵² The DBW substituted fluridone for the second sequential diquat treatment at the Franks Tract and Little Venice sites, thus reducing amount of diquat used. As a precaution against chemical mixing, fluridone applications did not begin until water samples showed levels had returned to *non defects* when tested for diquat.

As part of the adaptive management policy, the treatments were monitored to see how sequential treatments might improve efficacy. The diquat treatments at both locations were probably the most efficacious of any diquat site treated in 2002. This was probably due to optimum treatment conditions. Turbidity was low, plants were not yet heavily coated with sediment or algae, and the weather was calm, warm, and sunny. Approximately the top 2-4 feet of biomass defoliated in site 15, Little Venice Island because of diquat treatment. Approximately 4-10 feet of plant tops were defoliated in Site 173, Franks Tract. Diquat treatments seem to promote new growth within 3-4 weeks. See Appendix H, Item # 5 for Photo Logs of both sites.

In Site 15, fluridone efficacy was improved in 2002 from previous year. Fluridone was not used in Franks Tract in 2001. However, efficacy was improved in the treatment area that received sequential treatments compared to treatment areas that received only diquat. No *Egeria densa* plant appeared to die. The non-native species *Myriophyllum spicatum* (Eurasian water milfoil) seemed to be the most impacted. While the native *Ceratophyllum demersum* (coontail), seem to be impacted similar to *Egeria densa*. Conservatively, *Egeria densa* biomass was reduced approximately 25-35% compared to pre-treatment ocular surveys. Site 15, in 2001, did not show any reduction of biomass at end of season. Other diquat treatment sites in Franks Tract showed approximately 10-15% biomass

⁵⁰ See Risk/Benefit Analysis drafted by Dr. Lars Anders, USDA-Aquatic Research Service and letter from SePRO dated February 20, 2002 and in Appendix H. See also findings in EDCP EIR, Volume 2 *Research Trial Reports*, Report 1.

⁵¹ See EDCP EIR, Volume 2, Reports 1 & 2 for research trials and evaluations of efficacy.

⁵² It can have transient (less than 24 hour, often less than 6-8 hour) impacts on algae and some invertebrates such as daphnias when treatment concentration is close to max rates. 2002 Washington et al. pp. 128-144. Conversation Dr. Lars Anderson, January 21, 2003.

slightly lower percent survivals than other sites. Clearly, it is not related to amount of chemical present, as other sites with chemical residues do not show the same pattern. In addition, Delta smelt percent survival results for species tested in the same field water were better than the fathead results. Since fathead minnows are more hardy than smelt, it makes it less likely that the fathead results are related to chemical application.⁵⁶ *Pimephales promelas* (fathead minnow) growth was comparable to the range of fluridone tidal/dead-end and diquat results.

DO levels collected by applicator crews at sites 15 and 173 during the application period remained above 5.0 mg/l. Site 173 showed a slight drop in DO that may have been related to time-of-day, diquat treatments the previous week, or both factors combined. Temperatures reflected ambient temperatures in locations adjacent to Little Venice Island and within Franks Tract.⁵⁷

Based on the addition of Sonar Precision Release, the preliminary efficacy findings of Site 15 and Site 173, and the environmental monitoring results; the DBW is currently in the process of adding an Addendum to the EIR that would allow the use of fluridone in other sites along with the option of sequential treatments. The Addendum should be completed before March 2003. From an impact perspective the sequential use management option has an advantage in that it eliminates at least one diquat treatment every times it is implemented.

3.3.5 Chemical Range Evaluation—"Chemical residue found" compared to "bio-toxicity result ranges"

After examining the Chemical Range Evaluation, the DBW found no negative trends between chemical applications and bio-toxicity results. Comparisons of the ranges of all bio-toxicity results to the chemical residue results showed that, all sampling locations where chemical residues were detected fell in the same range as results that had no chemical residue detection. This included both pre and post non-detect samples. There were two exceptions: one fluridone *Pimephales promelas* growth result and one *Ceriodaphnia dubia* diquat result. In the following evaluation samples that did not have chemical present were called *non-detects* and samples that did have chemical present were called *detects*. See Appendix F for tabular and graph data showing range comparisons.

3.3.5.1 Fluridone

Selenastrum capricornutum non-detects for growth ranges in million cells/ml were 1.06-2.13 while growth rates for *detects* were 1.10-1.60 million cells/ml.

to treatment site to better isolate bio-toxicity results actually related to chemical applications in 2003.

⁵⁶ See Appendix G, Item #5 for Maximum Concentration Levels (MCL) and LC50 table and Figures G-1 through G-3 for comparisons of smelt and fathead minnow results.

⁵⁷ See graphs in Appendix A, Item # 2, Figures A-1&2 and A-9 & 10

reduction in 2002. Additionally, *Egeria densa* and coontail biomass in other sites had re-grown by end of season.⁵³

3.3.4.2.2 Monitoring Details at Sequential Sites:

Pre and post water analysis were collected with diquat and fluridone sequential applications at site 15 and site 173. The pre-sonar bio-toxicity results were also the diquat post results.⁵⁴ See tables in Appendix C Single Site Summaries for all environmental monitoring water quality results.

Little Venice was treated August 1 with diquat by August 5 there were *no detects* of diquat at either the inside location or in receiving waters. Fluridone treatments were begun August 7. On September 27, 48 hours after fluridone treatments were completed, chemical residue amounts showed 2.0ppb fluridone inside the site and *no detect* in receiving waters.

Franks Tract was also treated August 1 with diquat. On August 5, there was a level of 10.5 ppb diquat still recorded inside the treatment area. The receiving-waters sample was a *no detect*. Clarity of water, density of plant, and poor hydrologic circulation in this corner of Franks Tract are most likely the reasons for lingering diquat levels. On August 9, site 173 had diquat *no detects* in both the inside and receiving water samples and fluridone treatments were begun August 13. On September 27, the fluridone post samples a 1.2 ppb detect in waters inside the treatment location and *no detect* in receiving waters.

Selenastrum capricornutum (algae) growth in sites 15 and 173 were comparable to fluridone tidal/dead-end sites and diquat sites. *Ceriodaphnia dubia* (waterflea) 96-hour and 7-day percent survivals were fluridone tidal/dead-end sites and better than some diquat sites. *Ceriodaphnia dubia* 7-day progeny counts were comparable to both fluridone tidal/dead-end and diquat sites. *Pimephales promelas* (fathead minnow) 96-hour and 7-day percent survival results are comparable to both fluridone tidal/dead-end and diquat sites with the exception of one 7-day result from the Franks Tract post sample collected in receiving waters. This sample showed no detect of chemical, yet had a 60% survival rate. At 96-hours this same test showed 77.5% survival. The three other tests conducted that day in the lab showed 85% survival at 96-hours. Site 173 post inside was 67.5 at 7-days. Site 15 post inside sample was 75% at 7 days while the receiving waters was 70% at 7-days.⁵⁵ It is not apparent why these two locations showed

⁵³ This estimate based on a minimum of three rake samples per site, each visit and qualitative observations. Air photo acreage estimates will not be available for at least a year. The DBW is currently exploring other methods for measuring efficacy. Acreage estimates for 2001 could not be made due to poor quality air photos. The September 11 event grounded flights and photos were not taken until October when sun angle and weather conditions were not conducive to the types of photos needed. See Appendix H, Item #3.

⁵⁴ 4-days after treatment post results

⁵⁵ Currently, the protocol does not require an outside adjacent water sample as a control. However, there is often such disparity between sonar pre and post sample because of the six to eight week difference. The DBW is considering collecting a representative water sample adjacent