

# AZPDES PESTICIDE GENERAL PERMIT

## IMPACT ON THE AQUATIC APPLICATOR

### A HYPOTHETICAL CASE STUDY



Frederick A. Amalfi  
Aquatic Consulting & Testing, Inc.

# CASE SCENARIO

---

- 200 Acre Urban Lake
- Created within a Water of the U.S. as part of a flood control project.
- Part of municipal park system



# Lake Uses

- ◉ Boating
- ◉ Fishing
- ◉ Swimming



# Disgnated Uses

---

- Full Body Contact (FBC)
- Fish Consumption (FC)
- Aquatic and Wildlife (A&Ww)



# Historical Pest Issues

---

○ Midge flies



○ Algae blooms



○ Submerged weeds



# Historical Pesticide Use (hypothetical)

---

- Altosid (methoprene)
- Cutrine Plus (chelated copper)
- Cutrine Ultra (chelated copper+surfactant)
- Komeen (copper)
- Earthtec (copper)
- Reward (diquat)
- Navigate (2,4-D)
- Phycomycin (peroxide)
- Aquathol (endothall)
- Hydrothal (endothall)
- Clipper (flumioxazin)

# Do we need to file NOI?

---



- Answer: **YES**-the municipality as the owners and final decision makers

# Do We Need to Use Integrated Pest Management?

---



Answer: **YES**

# IPM Basics-PGP Style

---

- ① Identify the Problem
- ② Annual Pest Management Plan
- ③ Pesticide Use Surveillance

# IPM Basics: Identify the Problem

---

- ① Establish target pest density that serves as action threshold.
- ② Identify target species.
- ③ Determine current density and potential distribution.

# IPM Basics:

## Pest Management Plan

---

- Prior to first application and annually thereafter.

Evaluate:

- No action
- Prevention
- Mechanical or physical methods
- Cultural methods
- Biological methods
- Pesticides

# IPM Basics-Pesticide Use Monitoring & Surveillance

---

- ◉ Surveillance prior to each application to assess if pest threshold has been met.
- ◉ Assess environmental conditions to determine treatment feasibility.
- ◉ Assess restrictions, timing, and method to reduce environmental impact.
- ◉ Assess if target species is in susceptible developmental stage.

# Additional Monitoring Requirements

---

- ◉ Measure amount to assure lowest effective amount is used.
- ◉ Equipment maintenance monitoring and calibration.
- ◉ Visual monitoring for adverse incidents

# Do I Need to Submit a Pesticide Discharge Monitoring Plan (PDMP)?

---

- Treatment threshold for weed, algae, vegetation and nuisance animal control is 80 acres or 20 linear miles at water's edge.
- Count each area only one time regardless of number of pesticide applications to each area annually.

# Do I Need to Submit a Pesticide Discharge Monitoring Plan (PDMP)?

---

- If you limit any application to <80 acres, a PDMP is not required.



# Assumption & Scenario 1

---

- ◉ We have submerged weeds in the lake that exceed our threshold density for response.
- ◉ We have filed our NOI.
- ◉ We always want to limit treatment areas to <80 acres.
- ◉ What do we do?



# Work Through the IPM

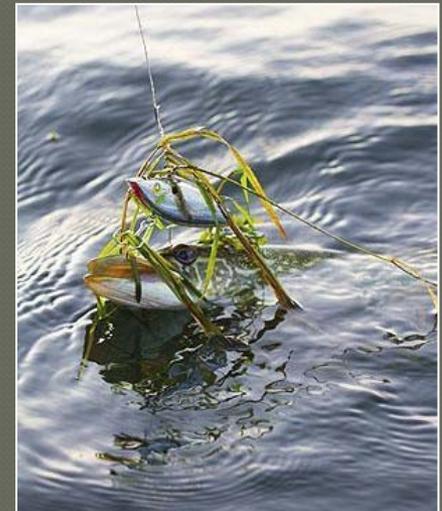
---

- ◉ What is the target species? Coontail (*Ceratophyllum*)
- ◉ Has the threshold density or distribution been met?  
Yes
- ◉ Are environmental conditions conducive to treatment? Yes
- ◉ Are there any restrictions, timing decisions, or method available to reduce environmental impact?  
Yes, and will be evaluated in decision process.
- ◉ Is the target species in a susceptible developmental stage? Yes

# Select the Best Approach:

## No Action

- If we do nothing, boating, swimming, fishing, and flood control capacity are adversely impacted.



# Select the Best Approach:

## Biological

---

- There is ingress and egress- can't use herbivorous fish (White Amur).



# Select the Best Approach:

## Physical/Mechanical

---

- ⦿ Cutting or harvesting access difficult.
- ⦿ **Mechanical cost very high.**
- ⦿ Cutting allows return and spread
- ⦿ Disposal difficult and costly.
- ⦿ **Dye-spreads to more than 80 acres.**



# Select the Best Approach:

## Prevention

---

- Can't stop ducks from spreading vegetative fragments.
- Inflows from outside water sources containing vegetative fragments.
- Source water carries vegetation.



# Select the Best Approach:

## Cultural

---

- ◉ Multi use: irrigation tail water, treated effluent, pumped groundwater, runoff, flood waters.
- ◉ Multi-jurisdictional waters make environmental manipulation difficult.



# Select the Best Approach: Herbicide

---

- Effective, relatively inexpensive, seasonally appropriate.
- Which one to use?



# Selecting the Best Herbicide

Herbicide	Active ingredient	Target susceptibility	Non-target toxicity	Ease of application	Restrictions	Total score
Reward	Diquat	2	2	2	3	9
Komeen	Copper	2	3	2	3	10
Hydrothol (granular)	Endothall	3	1	3	1 (fish)	8
Aquathol (granular)	Endothall	2	3	3	3	11
Navigate	2,4-D	3	3	3	3	12
Clipper	Flumioxazin	3	3	3	1 (pH)	10

Rating 1 = poor 2 = moderate 3- good to excellent

# Scenario 1

---

- Application made.
- Lake monitored for adverse impact-none.
- Target plant eradicated.

Life is good.



# Assumption and Scenario 2

---

- ◉ We now have a bloom of the toxic algae *Prymnesium parvum*.
- ◉ We want to limit treatment areas to <80 acres.
- ◉ We have filed our NOI.
- ◉ What do we do?



# Work Through the IPM

---

- ◉ What is the target species? *P. parvum*
- ◉ Has the threshold density or distribution been met?  
Yes-any presence creates an emergency
- ◉ Are environmental conditions conducive to treatment? Have no choice
- ◉ Are there any restrictions, timing decisions, or method available to reduce environmental impact?  
Only in choice of chemical treatment
- ◉ Is the target species in a susceptible developmental stage? Assume yes-No choice

# Select the Best Approach: No Action

---

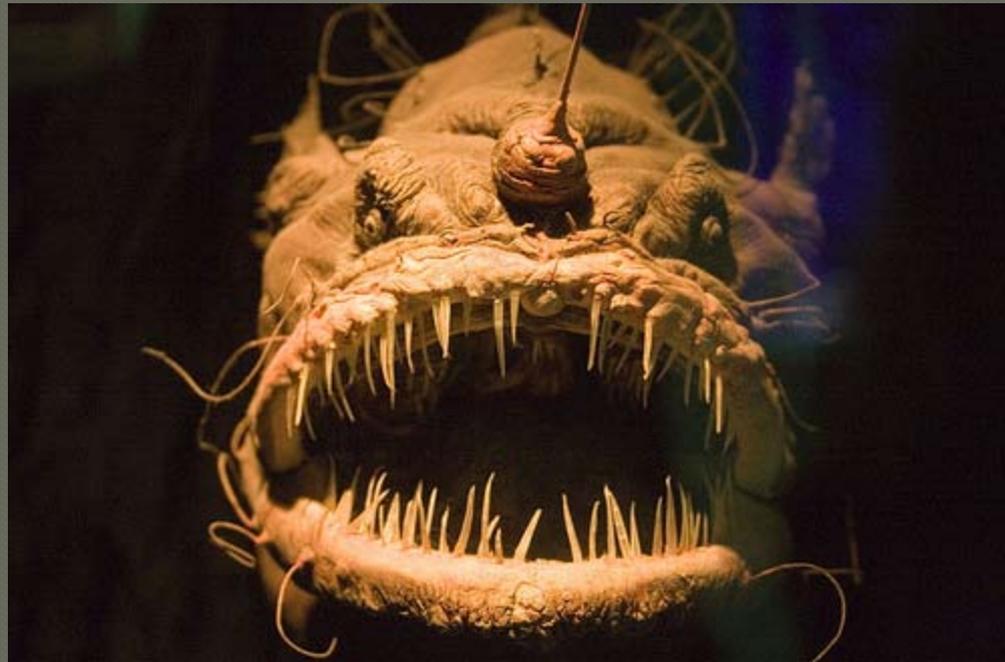
- If we do nothing, all the fish in the lake may die.



# Select the Best Approach: Biological

---

- None exist.



# Select the Best Approach: Physical/Mechanical

---

- ⦿ Physical light reduction with dye: may slow down growth rate, but will not kill it.
- ⦿ No mechanical methods available.

# Select the Best Approach:

## Prevention

---

- Multiple source waters can contain the organism
- Birds and other wildlife can transfer the organism.
- Boaters and fishermen can transfer the organism.
- Public education can be a component of the IPM

# Select the Best Approach:

## Cultural

---

- ◉ Multi-jurisdictional waters make environmental manipulation difficult.
- ◉ Multiple water sources.
- ◉ Multi use: irrigation tail water, treated effluent, pumped groundwater, runoff, flood waters.

# Select the Best Approach: Herbicides

---

- Really only one solution.
- Copper at 0.2 ppm through the entire water column is effective in killing the organism.
- Peroxide and permanganate destroy the toxin, but the dosage to kill the organism is not well-established.

# We Select the Best Established Control Procedure: Apply Copper at 0.2 ppm

---

- ⦿ We apply copper at 0.2 ppm to the entire lake and the entire water column.

**WARNING! WARNING! WARNING!**

- ⦿ We just exceeded the 80 acre threshold.
- ⦿ **We probably just exceeded the Arizona Surface Water Quality Standard for copper.**
- ⦿ A fisherman reported 8 dead bass the next day.

# The Consequences

---

You got some 'splainin' to do, Lucy!



# The Consequences

---

- The 200-acre application just triggered the need for filing a PDMP and annual report.
- We must notify ADEQ of the adverse incident within 24 hours.
- We must complete an adverse incident report within 5 days.
- We must provide a corrective action report to ADEQ.
- The surface water standard violation could subject us to a \$25,000 per day fine.
- The dead fish could subject us to a \$25,000 per day fine.

# Consequences

---

- We humbly request that ADEQ establish a policy for temporary violation of WQ standards - *toxic levels of the most effective pesticides are needed to reduce the target species.*
- Background monitoring needs to be emphasized to establish baseline conditions (non-application related natural mortality levels) of non-target species mortality in each water body.

# PDMP Requirements

---

- **Identification of Discharge Management Team.**
- Person responsible for managing pests in the pest management area.
- Person responsible for developing and revising the PDMP
- Person responsible for developing, revising, and implementing corrective actions
- Person responsible for pesticide applications.

# PDMP Requirements

---

- ◉ **Pest Management Area Description**
- ◉ Physical description.
- ◉ Map showing geographic boundaries.
- ◉ Description of pest problems (target species, thresholds for action, water quality standards that may be impacted).

# PDMP Requirements

---

- ◉ **Control Measures Description**
- ◉ Evaluation of control measures.
- ◉ How will you comply with water quality standards.
- ◉ List of active ingredients in each pesticide.

# PDMP Requirements

---

- ◉ **Schedules and Procedures**
- ◉ Application rates and frequency
- ◉ Spill prevention and response procedures.
- ◉ Pesticide application equipment cleaning, calibration, and repair.
- ◉ Pest surveillance procedures.
- ◉ Environmental condition assessment.
- ◉ Adverse incident response procedures.
- ◉ Pesticide monitoring procedures.

# Annual Reporting

---

- Operators name, permit number, and contact.
- **Identification of all waters treated.**
- Pesticide use patterns.
- **Pesticide applicators.**
- Total annual amount of each pesticide used.
- **If applications were addressed in the PDMP**
- Description of all adverse incidents
- **Description of all corrective actions.**

Will We Actually Have to  
Do All of This?

---

We Await The Final Decision

