9/20/90

ECOLOGICAL EFFECTS BRANCH REVIEW

CHEMICAL: Chlorothalonil, Bravo 720

100.0 Submission Purpose:

100.1 Pesticide Use and Submission Purpose:

The Texas Department of Agriculture has declared a crisis exemption and has authorized the use of Chlorothalonil on 1200 acres of chili peppers in Hudspeth, Pecos, and Reeves Counties. The dates of authorization, August 10-24, 1990, have already passed and it is assumed that the application by aerial methods has been completed.

100.2 Formulation Information: Bravo 720

Active Ingredient: Chlorothalonil.....54%
Inerts.....46%

Manufactured by Fermenta Plant Protection Co.

100.3 Application Methods, Directions, and Rates (Excerpted from the request).

"Bravo 720 may be applied at a rate of 1.5 lbs. ai (1 qt. product) per acre per application. Application only in a spray volume of no less than 5 gallons of water per acre at an interval of 10 to 14 days. Do not make more than 2 applications of product per growing season. Do not apply more than 3.0 lbs. ai (2 qts. product) per acre per growing season.

100.4 Target Organisms:

Alternaria/Fusarium fungal disease has been reported to have attacked fruit and foliage of chili pepper plants in Hudspeth, Pecos, and Reeves counties. It could, reportedly, devastate the crop if not acted upon quickly. Apparently the outbreak of the fungus was triggered by rainy, damp conditions during late July and early August.

100.5 Environmental Labeling:

"This product is toxic to fish, aquatic invertebrates, and marine/estuarine organisms. Runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not apply when weather conditions favor drift from treated areas."

101.0 Hazard Assessment:

101.1 Discussion:

This emergency exemption has not specified locations within the counties of the chili pepper crops on which application would have been carried out. Several rivers and tributaries are located in these counties along with springs supporting endangered fish (see 101.3). The time frame for this exemption would have permitted 2 applications if the first was carried out on or around August 10. The risk assessment will include scenarios based on two applications by aerial methods (maximum of 3.0 lbs ai with 10-14 day application interval).

Environmental Fate

Chlorothalonil shows moderate breakdown tendencies in most soils with half life values of approximately 30 days. Mobility is slight in sandy, clay, or silty-loams, and moderate in sandy soils. Halflife in water is approximately 30 days at pH levels of 5-7. Half life in aquatic sediments is 5-15 days.

Residues on terrestrial food items would range from 360 ppm on short grasses to approximately 10 ppm on fruits or, in this case, peppers with a single application of 1.5 lbs ai per acre. The residues expected on crops following 2 applications with a 10 day interval would be approximately 478 ppm on range grass and 13 ppm on fruits or vegetables.

Estimated residues in a 1 acre body of water 6 feet deep receiving a 2% runoff of pesticide after a single 1.5 lbs ai/acre application would reach 18.3 ppb. Possible residues from accidental drift or overflight during aerial spraying might reach levels of approximately 91.5 ppb in 6 feet of water and 1,098 ppb at a 6" surface level. A second application within 10 days of the first could result in levels of 30 ppb in 6 feet of water with 2% runoff of the fungicide.

101.2 **Risk to Non-Target Organisms**

Terrestrial Organisms: Little hazard is expected for avian or mammalian life as Chlorothalonil is categorized as practically non-toxic to these groups. LC_{50} levels for both mallard and bobwhite quail exceed 10,000 ppm, well above expected concentrations on terrestrial plant surfaces. The LD_{50} level of laboratory rats (>10000 ppm) is also well above these levels.

Aquatic Organisms: Chlorothalonil has been shown to demonstrate very high toxicity to aquatic invertebrates and fish(LC_{50}'s < 1 ppm). Expected levels of contamination from a 2% runoff/1 acre pond scenario were above 1/2 the LC_{50} levels of most species tested. They exceeded the criteria for risk to non-target aquatic organisms (1/5 LC_{50}) by 2.5 times based on one 1.5 lb ai/acre application. Direct application from spray drift with a 1.5 ai/acre application rate could exceed the LC_{50} value of Bluegill (84 ppb). With aerial application, as was proposed for the Texas use pattern, drift of pesticide to adjacent streams, ponds, lakes, and, canals is a possibility which must be considered. Hopefully precautions were taken to prevent this scenario from occurring.

101.3 **Endangered Species Concerns:**

Due to the low toxicity of chlorothalonil to avian and mammalian species, little to no adverse affects to these groups would have been expected from the application.

EEB is concerned about the fact that all three of the subject counties provide habitat for endangered fish species. Due to the fact that exact locations of the chili pepper crops were not provided, it is difficult to determine whether spraying operations may actually have presented hazard to these species.

The Pecos Gambusia is located in Phantom Lake Springs, Griffin Springs, East Sandia Springs, and Leon Creek in Reeves County. It is also listed for Hudspeth County.

The Comanche Springs Pupfish is located in Toyah Creek and Phantom Lake Springs in Reeves County and in Giffin and San Solomon Springs as well. Leon Creek/Diamond Y areas are also home for the Leon Springs Pup Fish which is listed for Reeves and Hudspeth Counties. In the case

of the Comanche Springs Pupfish much of the present habitat appears to be in actual irrigation canal systems which enter Lake Balmorhea. Such slow moving systems receiving agricultural pesticide runoff could certainly be a cause for concern as flush rates would not be rapid. It is hoped that the Texas Dept. of Agriculture was aware of the locations of these endangered species and that no aerial application of chlorothalonil was carried out near these protected habitats.

101.4 Adequacy of Labeling:

The present labeling does adequately address the fact that the product is toxic to freshwater and marine fish and invertebrates. "Neighboring areas" should be replaced with a more descriptive paragraph detailing the types of aquatic habitats to be avoided (ie streams, canals, lakes, bogs, ponds, and marshes).

In the case of the Texas crisis exemption, specific mention of habitat locations for the Pecos Gambusia, the Comanche Springs Pupfish and the Leon Springs Pupfish should have been forwarded to potential applicators.

101.5 Adequacy of Toxicity Data:

The present data is adequate for purposes of conducting this risk assessment.

102.0 Conclusions:

The use of chlorothalonil on 1200 acres of chili peppers presents a limited area of risk, though risk to aquatic species in adjacent water bodies was possible. The exposure potential is somewhat heightened by the fact that aerial application was used. Estimated environmental concentrations have exceeded Agency criteria for possible risk to both non-endangered aquatic organisms or any of the 3 endangered fish species mentioned previously if a 2% pesticide runoff or direct application from spray drift occurred within their respected habitats.

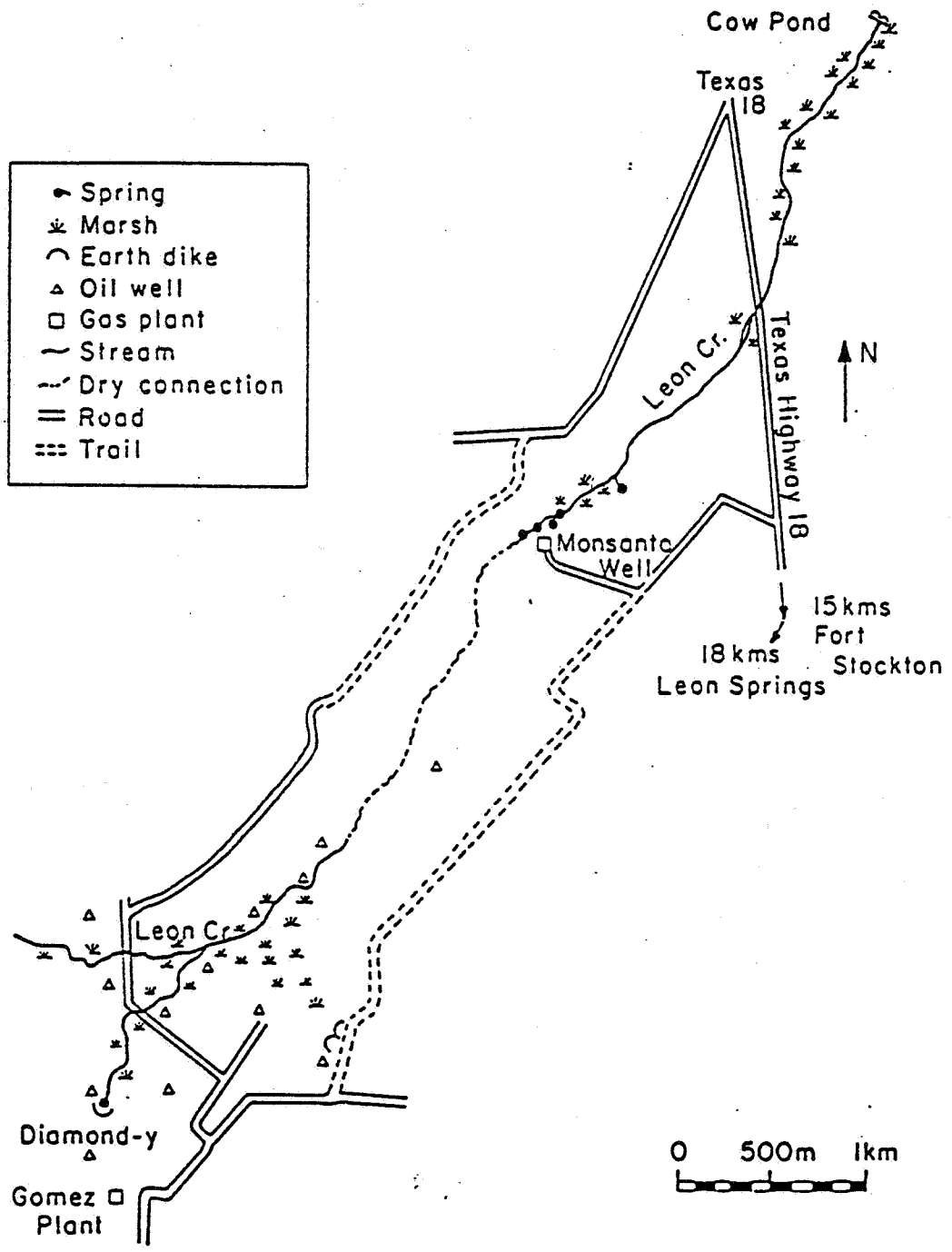
Without proper identification of the site locations of the chili pepper crops in these counties it is difficult to determine if risk to aquatic species actually occurred from the August application. Certainly the potential existed within the small areas of consideration.

Reviewed By: Brian Montague, Fisheries Biologist
Ecological Effects Branch
Environmental Fate and Effects Division
9/20/90

Approved By: Ray Matheny, Supervisory Biologist
Ecological Effects Branch
Environmental Fate and Effects Division
9/20/90

Approved By: James W. Akerman, Chief
for Ecological Effects Branch
Environmental Fate and Effects Division
9/20/90

Figure 2. Habitat of Cyprinodon bovinus in Diamond Y Spring and Leon Creek near Fort Stockton, Texas (from Hubbs 1980).



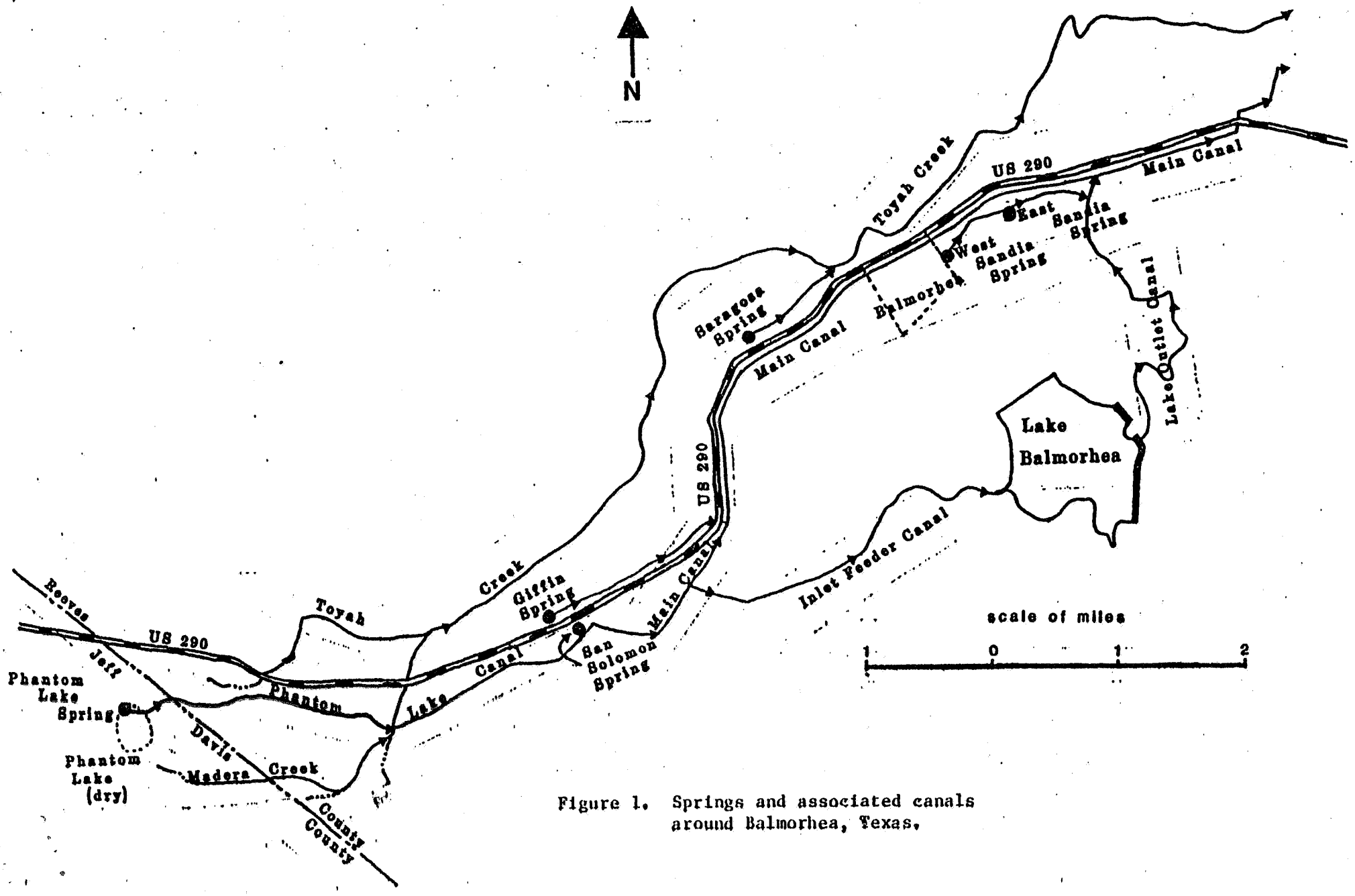


Figure 1. Springs and associated canals around Balmorhea, Texas.