UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

MEMORANDUM

SUBJECT: County-Level Usage for Oryzalin and Permethrin in California in Support of a San Francisco Bay Endangered Species Assessment

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INTRODUCTION

This memo accompanies county-level pesticide usage information in support of EPA's Effects Determination for the California San Francisco Bay Endangered Species Assessment. Seventy-five pesticide active ingredients are involved in the case *Center for Biological Diversity (CBD) vs. EPA et al.* (Case No. 07-2794-JCS).*et al.* (Case No. 02-1580-JSW-JL) regarding risk to specific San Francisco Bay endangered species. Sixty-seven risk assessments associated with this case still need to be completed. This document includes data for the following two pesticides to be assessed:

- Oryzalin
- Permethrin.

Pesticide usage data include average and total annual pounds applied; average and total annual area treated; and average, 95th and 99th percentiles, and maximum application rates across ten years (1999-2008). Pesticide usage data for the same variables were also compiled for 1994 to 1998 but not merged with the newer data because error identification was not available for the older data. This memo describes the methodology and data sources used by BEAD.

COUNTY-LEVEL USAGE

County-level usage data were obtained from California's Department of Pesticide Regulation Pesticide Use Reporting (CDPR PUR, 1994-2007) database. California State law requires that every agricultural pesticide application be reported to the state and made available to the public. Under California law, agricultural uses reported include pesticide applications to parks, golf courses, cemeteries, rangeland, pastures, and along roadside and railroad rights-of-way. According the California Department of Pesticide Regulation, the primary uses not required to be reported include "home-and-garden uses and most industrial and institutional uses" (http://www.cdpr.ca.gov/docs/pur/purmain.htm). Therefore, CDPR PUR is considered the most comprehensive source of pesticide usage data for the state and includes both agricultural and non-agricultural sites.

Fifteen years (1994-2008) of usage data from CDPR PUR were obtained for every pesticide application made on every agricultural use site at the field level. However, the data were compiled separately for the years 1994 through 1998 and 1999 through 2008 because identification of data errors were provided beginning in 1999. The following is a description of the variables calculated and the methods used. These methods apply to each set of data (1994-1998 and 1999-2008). An additional error identification step was included in the 1999-2008 data set as described in the error processing section of this document.

The following describes calculations made within each data set (1994-1998 and 1999-2008). Average pounds applied were calculated for each chemical at the county level by site and pesticide. The number of records represents the number of records used in the calculation of average pounds applied. Total annual pounds applied were calculated for each pesticide by county and site. Pesticide usage was aggregated across all observations for each chemical-county-unit treated combination. In addition, pounds applied were calculated for each year across all counties by pesticide and site. Finally, pounds applied were also calculated for each year across all sites by pesticide and county.

Because pesticide applications are made in different area units, the units of area treated are provided where available. Years in which there is no reported use in a county are included as zeros in the calculation of the averages for pounds and area treated. Averages reflect years without use.

Application rates (average, 95th and 99th percentile, and maximum) were calculated across all observations for each data set, but not within years, for each chemical-county-site-unit treated combination. These calculations were carried out for existing usage information; however, zeros were not added in for years without usage because these figures do not reflect actual usage. Also, if a record had incomplete information (e.g., pounds applied

was available but area treated was not), the record was kept in the data set and is reflected in the number of records, but it was not used in the calculation of application rate. The number of records or observations represents the number of records used in the calculation of average, maximum, and percentile rates. Blank cells were used in the spreadsheet for years where usage was reported but data are missing.

Further area treated and application rate data aggregations are included. Total annual area treated was calculated for each chemical at the county level by site and pesticide active ingredient. Application rates were calculated for each chemical-site combination across all years and counties. Application rates were calculated for each chemical-county combination across all years and sites.

Methods

1. Combine pesticide usage data for 58 counties for all 13 years from original CDPR PUR data.
2. Keep information only on two chemicals of interest.
3. Application Rates
    a. Calculated as "pounds of active ingredient applied" divided by "area treated" for each observation.
    b. Calculated across all observations within each dataset for each chemical-county-site-unit treated combination: Average, Maximum, 95th and 99th Percentiles for application rates, and the Number of records.
    c. The number of records represents the number of records used to calculate average, maximum, and percentile values.
4. Pounds Applied and Area Treated
    a. For each year, chemical-county and site-unit, sum across all records (applications) to obtain total pounds applied, total area treated, and the number of records. *Note: The number of records represents the records used to calculate total values and may be in some cases smaller than the total number of records for each chemical-county-site-unit treated combination due to missing data.*
    b. Calculate average annual pounds applied and average annual area treated for each data set, including zeros for years with no reported use.
5. Estimation Steps for Aggregated Usage
    a. Application Rate:
        Calculate across all observations for each data set for each chemical-county-unit treated combination: Average, Maximum, 95th Percentile, 99th Percentile for application rates, and the Number of records. The number of records represents the number of non-missing records used to calculate average pounds applied and average area treated
    b. Pounds Applied and Area Treated:
        i. Calculate for each year and chemical-county-unit treated combination: total pounds applied, total area treated, and the number of records. The number of records represents the number of non-

missing records used to calculate average pounds applied and average area treated

ii. Combine estimated values for each data set.

iii. Calculate average annual pounds applied and average annual area treated within each data set.

iv. Rate by site, Pounds by site, and Pounds by county use similar procedures but data are aggregated as required.

Note: The number of records represents the number of non-missing records used to calculate average/max/percentile values and average pounds applied and average area treated

ERROR PROCESSING AND DATA UNCERTAINTIES

CDPR PUR developed a statistical methodology for identifying outliers in the 1999 – 2008 data for area treated and pounds applied. CDPR PUR documentation explains that errors in the data can occur for many reasons such as a misplaced decimal, an incorrect measure, area treated or units are incorrect, or if a diluted concentration of a pesticide is reported. CDPR PUR describes outliers as an indication of potential errors and recommends that the following rules be applied: "Pounds of AI per area treated is greater than 200 for non-fumigants or greater than 1000 for fumigants or pounds of product per area treated is greater than 50 times the median rate for this product on this commodity".

BEAD removed outliers flagged by CDPR PUR before calculating the reported statistics. Thus, statistics calculated directly from data obtained from the California Pesticide Information Portal, the online query service, will not correspond to BEAD's calculated values.

BEAD provided four values for application rates to illustrate situations where a small number of observations may skew average and maximum application rates, which may indicate potential errors. In some cases the average application rate was higher than the 95th or 99th percentile because extremely high application rates skewed the average. As discussed with EFED, these observations were kept in the calculations despite their extreme values.

BEAD further identified other records of questionable validity in the final data set using the following criteria:

- Average application rate > 95th percentile
- Number of records for pounds applied and area treated do not match
- Area units are missing or are labeled "miscellaneous"
- Less than one pound applied per year
- Less than one acre or 100 sq ft treated per year
- Calculated application rate is less than 0.1 lb per acre (or per sq foot)
- Less than four records of use (area, pounds, or application rate) within each dataset.

Using these criteria, over half of the records are identified as meeting one or more of these criteria. While these records were kept in as requested by EFED, BEAD recommends that

these records (identified in associated excel files) be used with extreme caution in any further assessments.

Other considerations concerning sites should also be noted. It is possible that the data may contain uses that have been cancelled. These data do not include home owner applied pesticides. CDPR data includes pesticide usage information for forest plantings for reforestation and deciduous, western hardwoods, and other unspecified forest trees. As with all pesticide use data, there may be instances of misuse or misreporting. Finally, there may be cases where CDPR data found online may differ from the data provided by BEAD because the online data is dynamic as CDPR may occasionally perform updates or error corrections as needed (Larry Wilhoit, personal communication, 2008 and 2009).

The county-level usage information is provided electronically as EXCEL spreadsheets entitled, SFB Group 3a.xls and SFB Group 3b.xls.

REFERENCES

CDPR PUR, 1994-2008. Online: http://calpip.cdpr.ca.gov/cfdocs/calpip/prod/main.cfm.

Wilhoit, Larry, 2009. California Department of Pesticide Regulation, personal communication via email with Monisha Kaul, January 21, 2009.

Wilhoit, Larry, 2008. California Department of Pesticide Regulation, personal communication via email with Monisha Kaul, August 8, 2008.

Previous Endangered Species Data Analyses by BEAD

Carter, J. and M. Kaul, 2009. County-Level Usage for strychnidin; strychnine; triclopyr, butoxyethyl ester; triclopyr, triethylamine salt; diflubenzuron; trifluralin; thiobencarb; chlorpyrifos; vinclozolin; iprodione in California in Support of a Red Legged Frog Endangered Species Assessment, DP # TBD

Carter, J., 2007. County-Level Usage for Propyzamide, Bromacil Lithium Salt, Methoprene, S-Methoprene, Methyl Parathion, Esfenvalerate, Naled, Dimethoate, and Hexazinone in California in Support of a Red Legged Frog Endangered Species Assessment, DP # TBD.

Carter, J. County-Level Usage for Linuron, 1,3-dichloropropene (Telone), Phosmet, Disulfoton, Oryzalin, Propargite, and S-Ethyl Dipropylthiocarbamate (EPTC) in California in Support of a Red Legged Frog Endangered Species Assessment, DP # TBD

Carter, J. & Kaul, M. County-Level Usage for glyphosate and associated isomers, permethrin, phorate, rotenone and associated isomers, tribufos, oxyfluorfen and ziram in California in Support of a Red Legged Frog Endangered Species Assessment, DP # TBD

Carter, J. & Kaul, M. County-Level Usage for 2,4-D, 2-4D,2-Ethylhexyl ester, 2,4-D Butoxyethanol Ester, 2,4-D, Diethanolamine salt, 2,4-D Dimethylamine Salt, 2,4-D, Isopropyl Ester, 2,4-D, Triisopropanolamine Salt, 4-(2,4-DB), Butoxyethanol Ester, Atrazine, Chlorthal-Dimethyl (DCPA), Diuron, Methidathion, Norflurazon, and Oxamyl in California in Support of a Red Legged Frog Endangered Species Assessment, DP # TBD

Kaul, M., 2010. County-Level Usage for Carbaryl, Metolachlor, S-Metolachlor, Naled, Simazine, and Sodium Nitrate in California in Support of a San Francisco Bay Endangered Species Assessment. Unpublished EPA document.

Kaul, M., 2010. County-Level Usage for Malathion, EPTC, Phosmet, and Potassium Nitrate in California in Support of a San Francisco Bay Endangered Species Assessment. Unpublished EPA document.

Kaul, M., 2006. County-Level Usage for acephate, aldicarb, azinphos-methyl, chloropicrin, diazinon, imazapyr, metam sodium, methamidophos, methomyl, and metolachlor, in California in Support of a Red Legged Frog Endangered Species Assessment, DP #TBD.

Kaul, M., 2007. County-Level Usage for carbaryl, malathion, oxydemeton-methyl, chlorothalonil, simazine, mancozeb, maneb, bensulide, captan, imazapyr salt, and bromacil in California in Support of a Red Legged Frog Endangered Species Assessment, DP # TBD.