

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

OFFICE of PLANNING and ANALYSIS
 REGION 6 DALLAS, TEXAS
 NOVEMBER, 1990



Region 6 Comparative Risk Project

Appendix A ECOLOGICAL REPORT

ECOLOGICAL

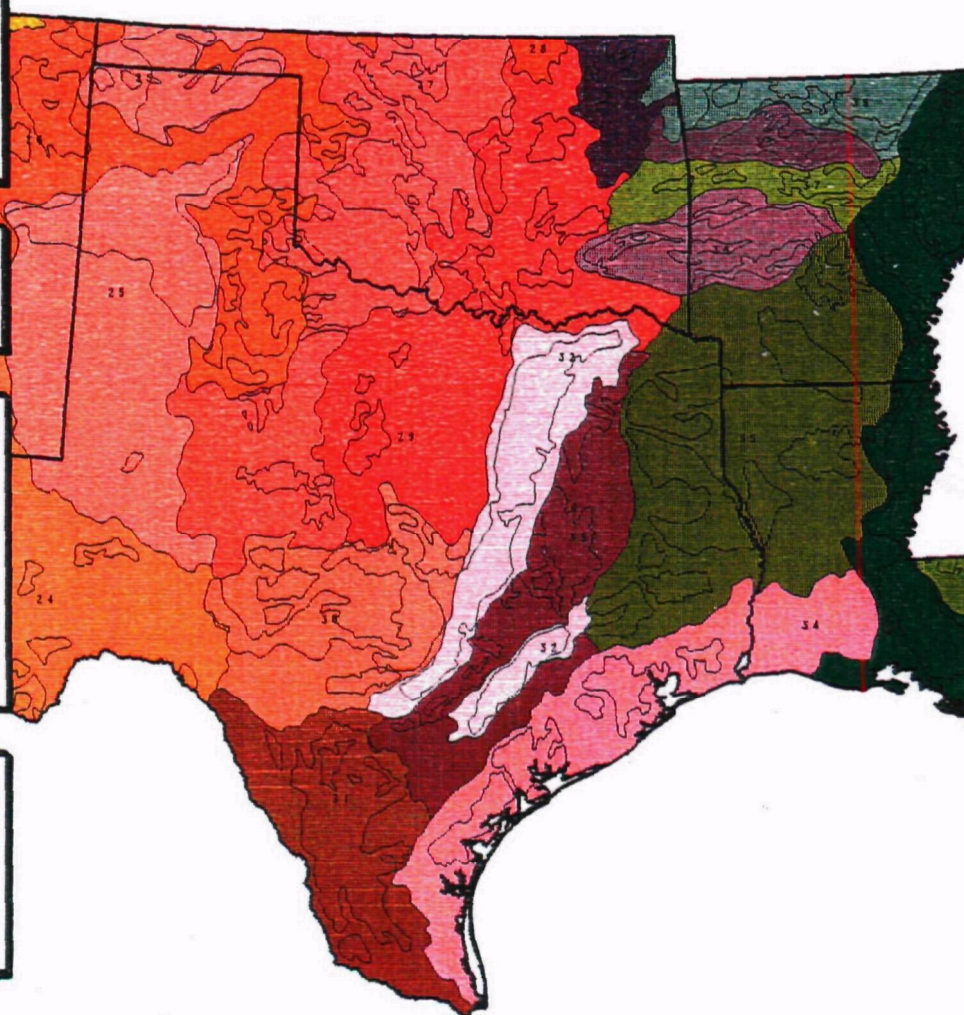
Highest Risk
 Physical Degradation of
 Terrestrial Ecosystems
 Pesticide Application
 Physical Degradation of
 Water and Wetlands
 * Global Warming
 * Stratospheric Ozone Depletion

Non Point Source
 Discharges to Water
 Hazardous/Toxic Air Pollution

Ozone/Carbon Monoxide
 Municipal Wastewater
 Discharges
 Hazardous Waste Sites RCRA
 Industrial Wastewater
 Discharges
 Groundwater Contamination
 Municipal Solid Waste Sites
 Industrial Solid Waste Sites
 Accidental Releases

Lowest Risk
 Superfund Hazardous
 Waste Sites CERCLA
 Particulate Matter (PM₁₀)
 Airborne Lead
 Storage Tanks

EPA Region 6 Ecoregions



Not Ranked:
 Drinking Water, Indoor Radon, Indoor Air
 Pollution, Radiation other than Radon,
 SO₂/NO_x.

*See Discussion

REGION 6 U. S. ENVIRONMENTAL PROTECTION AGENCY

APPENDIX A: ECOLOGICAL REPORT

Regional Comparative Risk Project

**November, 1990
Office of Planning and Analysis
Region 6 U. S. EPA
Dallas, Texas 75202**

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**Jerry Saunders
Chairman, Ecological Comparative
Risk Assessment Workgroup**

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I. ECOLOGICAL SUMMARY

The ecological risk assessment workgroup evaluated the residual risk posed by the 22 environmental problem areas identified by EPA Headquarters and the Regional Comparative Risk (RCRP) directors. We evaluated residual risk at the ecoregion level (Omernik, 1986) for the following reasons:

1. it was geographically and ecologically based;
2. the ecoregions could serve as a template for data collection ;
3. this approach lend itself well to geographic information system applications;
4. there are a wide variety of ecoregions within our five state region (portions of twenty-five ecoregions);
5. we were concerned about the general health of the large ecological units recognizable in the landscape; and
6. there was a short time frame to complete our initial evaluation of ecological risk.

Methodology

We made the assumption that ecological risk exists when ecological threat impairs the ability of an ecoregion to perform basic ecological functions. This approach to risk evaluation was taken because we recognized there is more to an ecosystem than aquatic or terrestrial organism production and that impacts to all basic ecological functions need to be examined to fully evaluate ecological risk. To identify basic ecosystem functions we made a brief review of the ecological literature and revised a list of basic ecological functions identified by Rodale (1972) and Southwick (1976), selecting those functions that related to the non-human environment. The list of basic ecosystem functions that we identified and that could be impaired by the twenty-two problems (or stressors) includes:

1. distribution of water, minerals, and nutrients via the hydrologic cycle;
2. oxygen production and carbon dioxide consumption;
3. filtering and detoxifying of pollutants.
4. soil production and maintenance; and
5. production of aquatic organisms;
6. production of terrestrial organisms;
7. conversion of energy (sunlight) into organic matter;

With a listing of basic problems and a listing of basic ecosystem functions, we chose to evaluate ecological risk for each ecoregion, by evaluating the impact of each problem on each ecological function.

We began our work with the development of a model. The variables included in the model represented variables common to all 22 problem areas: area of impact and degree of impact. A variable was also included to represent the differences from one ecoregion to another to withstand environmental stress, degree of vulnerability.

After conceptualization of the model we then proceeded to obtain information from the appropriate programs on area and degree of impact for each problem. Upon receipt of the

data the information was reviewed and quality controlled to ensure that appropriate values were entered into the computer for calculation of ecological risk index values. The degree of vulnerability values were taken from established data that could be obtained on endangered species, soil erosion rates, primary productivity, stream density and assimilative capacity. With data input complete, an ecological risk index value was generated for each problem per ecoregion and for the five state area.

When data for the majority of the 22 problems had been obtained, entered, and risk indices derived, it was possible to rank or estimate the ecological risk posed by each of the problems (Table 1).

Results and Discussion

Category 1 problems are those which were found throughout most ecoregions and in many situations impacted over one-third of the individual ecoregions. In addition, the impact from these problems is significant for it usually involves elimination of vegetative, aquatic and terrestrial populations with associated reductions in natural assimilative capacity and increased soil erosion. The magnitude of these impacts cannot be underestimated for large rates of conversion of land to agricultural land exceeds 30,000 acres per year in some states in our Region which in turn is then subjected to the application of fertilizers, pesticides, and herbicides.

Category 2 problems to some extent are an outgrowth of Category 1 problems. For example, non-point source stress would be expected to be great in areas with high rates of pesticide application, increasing agricultural production and high rates of urbanization. The hazardous/toxic air pollution problem ranks high because of the large number of facilities discharging chemicals to this media in Region 6 (over 1,300). Most of these facilities are not currently regulated by sufficient standards.

Category 3 problems represent a mixture of problems which are limited in scope, from 5 to 20 percent of the individual ecoregions. In general these problem areas have some established standards or State/Federal programs to control the emission.

Category 4 problems represent problems of limited area with effective control or responsive programs in place which help to reduce the residual risk.

Of particular concern are problems which go beyond the scale of ecoregion impacts and which are not ranked at this level. Such problems include stratospheric ozone depletion and global warming. The research in those areas indicates that climatic changes over the next century will result in increased temperatures. These problems should be of particular concern to in this Region because:

1. we have a large number of air toxic dischargers in Region 6 which may contribute significantly to the global problems;
2. we have a high percentage of the nation's coastal wetland resources which could be lost due to temperature increase and the associated sea level rise;
3. stratospheric ozone depletion and the resultant increase in UV-B radiation could erode

the foundation of the marine food web (marine organism larvae and phytoplankton) again impacting on the Regions wetlands;

4. and, the basic factors which determine ecoregion boundaries in our Region are primarily determined by climate, change in the climate causing shifting of these boundaries would have devastating consequences.

The risk associated with climatic change appears to be very high with lasting damage to the environment.

Table 1. Ecological Risk Rankings

Problems Posing Residual Ecological Risk

Category 1: (Highest Risk)

Physical Degradation of Terrestrial Ecosystems
Application of Pesticides
Physical Degradation of Water and Wetlands
*Global Warming
*Stratospheric Ozone Depletion

Category 2:

Non-Point Source Discharges
Hazardous / Toxic Air Pollutants

Category 3:

Ozone and Carbon Monoxide
POTW Discharges to Surface Waters
RCRA Hazardous Waste Sites
Industrial Point Discharges to Surface Waters
CERCLA Hazardous Waste Sites
*Municipal Waste Sites
*Industrial Waste Sites
*Ground Water Contamination
Accidental Releases

Category 4: (Lowest Risk)

CERCLA Hazardous Waste Sites
Particulate Matter
Airborne Lead
*Storage Tanks

* Estimated Ranking

Problem Areas For Which No Evidence Was
Provided To Indicate Ecological Harm:

SO₂ and NO_x , and Radiation other than radon

Problem Areas For Which The Workgroup Concluded
There Was Negligible Or No Risk:

Drinking Water (public and private), Indoor Air Pollutants, Indoor Radon

Conclusions

The lack of an established methodology for evaluating ecological risk led the ecological risk workgroup to develop a mathematical model to assist in the ranking process. The model's variables were common to all problem areas and represented each ecoregion's ability to withstand stress.

We found databases difficult to obtain, due to ongoing work responsibilities of workgroup members and Regional staff. Databases were obtained from within EPA, state and other federal agency sources. The data submitted frequently consisted of estimates due to time limitations and the regulatory nature of the information source (data was not usually gathered with risk research as its primary use). Nevertheless, we were able to complete a relative ranking of risk that sorted problem areas on the basis of area, degree of impact and degree of vulnerability of these areas of impact.

Aside from global warming, the problems of greatest ecological risk in Region 6 appear to stem from agriculture and silviculture. The conversion of forested wetlands and uplands to agricultural land or monoculture pine forests and subsequent application of pesticides and herbicides also results in non-point source water quality concerns. Of additional importance is the unregulated discharge of toxic air pollutants which may play a long term role in global warming and stratospheric ozone depletion.

II. INTRODUCTION

The Region 6 Comparative Risk Project began in April, 1990. The ecological workgroup was formed with representatives from various program offices with an expertise or knowledge of ecological functions and values. Our deadline for completion of this project was originally September 1990, however, the schedule was extended to November 1990. Communication with work group members was made by memorandum and telephone communications on at least a bi-weekly basis. At the beginning of our analysis, weekly meetings were in order, but when specific assignments were made meetings were reduced to once a month.

1. The intent and purpose of our analysis was to evaluate 22 environmental problem areas and relatively rank them on the basis of residual ecological risk.
2. We developed a mathematical model. We initially reviewed the methodologies for evaluating ecological risk utilized by Regions 1, 3 and 10 and then proceeded to develop a more quantitative approach.
3. We also chose to evaluate risk at the ecoregion level (Omernik 1986; Map 1) because:
 - a) it was geographically and ecologically based;
 - b) the ecoregions could serve as a template for data collection;
 - c) this approach lended itself well to geographic information system applications;
 - d) there are a wide variety of ecoregions within our five state region (portions of twenty-five ecoregions);
 - e) we were concerned about the general health of the large ecological units recognizable in the landscape; and
 - f) there was a short time frame to complete our initial evaluation of ecological risk.

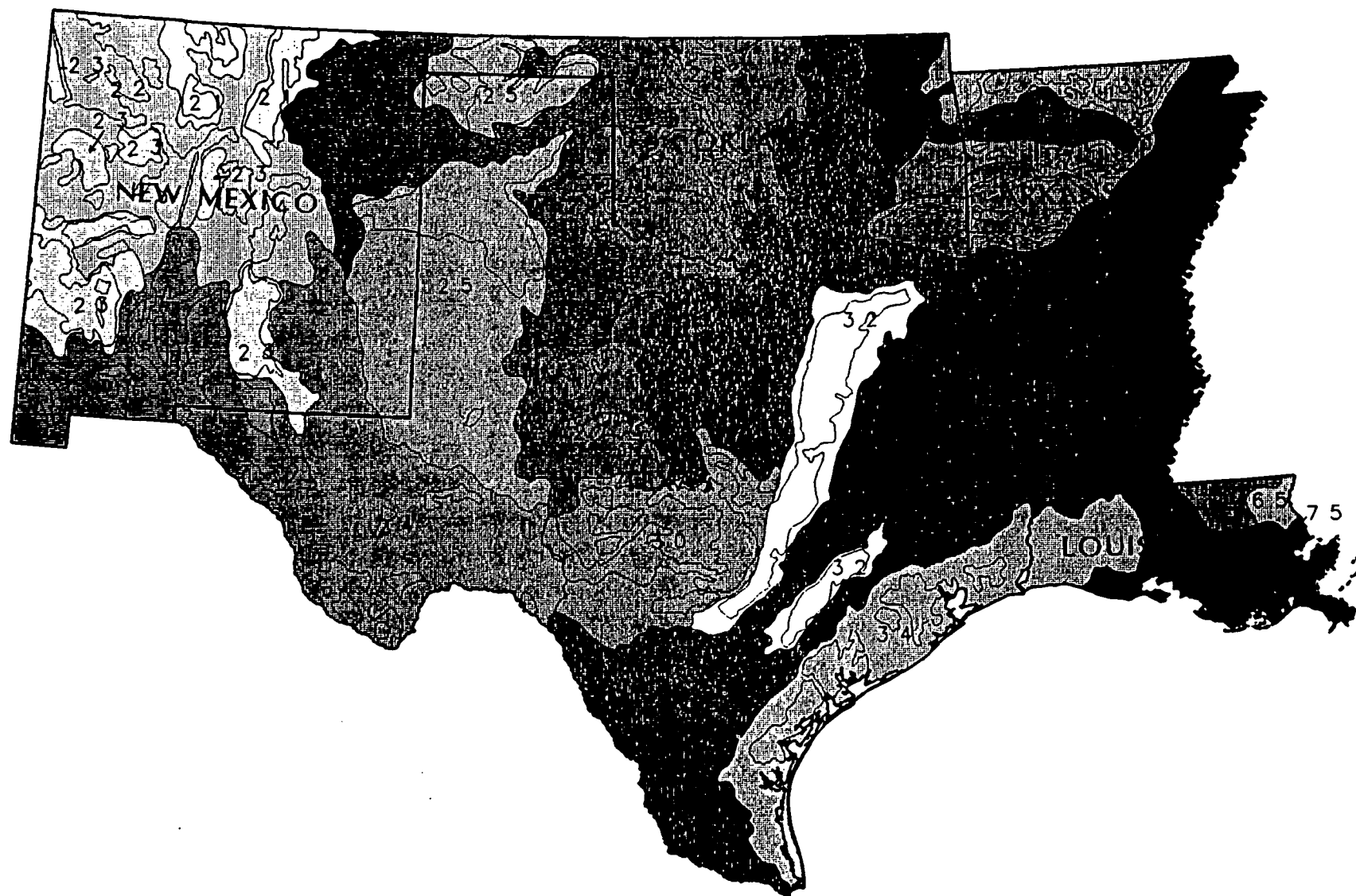
MAP LEGEND

- | | |
|--------------------------------------|---|
| 21) Southern Rockies, NM | ✓ 33) East Central Texas Plains |
| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| ✓ 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| ✓ 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| ✓ 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| ✓ 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| ✓ 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| ✓ 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 1

EPA Region 6 Ecoregions



III. APPROACH AND METHODS

Initial Approach to Risk Evaluation

We made the assumption that ecological risk exists when ecological threat impairs the ability of an ecoregion to perform basic ecological functions. This approach to risk evaluation was taken because we recognized there is more to an ecosystem than aquatic or terrestrial organism production and that impacts to all basic ecosystem functions needed to be examined to fully evaluate ecological risk.

To identify basic ecosystem functions we made a brief review of the ecological literature and reviewed a list of basic ecological functions identified by Rodale (1972) and Southwick (1976), selecting those functions that related to the non-human environment. The list of basic ecosystem functions that we identified and that could be impaired by the twenty-two problems (or stressors) includes:

- a) distribution of water, minerals, and nutrients via the hydrologic cycle;
- b) oxygen production and carbon dioxide consumption;
- c) filtering and detoxifying of pollutants;
- d) soil production and maintenance;
- e) production of aquatic organisms;
- f) production of terrestrial organisms; and,
- g) conversion of energy (sunlight) into organic matter.

With a listing of basic problems and a listing of basic ecosystem functions, we chose to evaluate ecological risk for each ecoregion, by evaluating the impact of each problem on each ecosystem function (Figure 1). To determine generally which stressors or problems would impact which functions we developed a simple evaluation matrix plotting problems or stressors on the x-axis and ecological functions on the y-axis (Figure 1). We then proceeded to discuss as a workgroup whether or not each problem would generally have an impact on each function and recorded an impact as an X in the matrix or an O if there was no anticipated impact (Figure 1). During our workgroup discussions it became apparent that there was a wide range of variability associated with the impacts of the various problems on any given function. We then realized that a numeric ranking system might be very useful in assisting us as we evaluated the impacts of each problem on each function and ranked the various problems. We wanted to replace the X's on our preliminary evaluation matrix (Figure 1) with a numeric value. An evaluation matrix with numeric values could be completed for each ecoregion.

Development of the Conceptual Model

Prior to formulation of a mathematical expression that would assist us in replacing our X's with numeric values, we had to take a closer look at the problems and the functions. We reviewed the range of problems to be evaluated and found twenty problems that were primarily chemical discharges and two problems that dealt with physical modification of the environment (Table 2). It was also apparent that the physical modifiers frequently would have a greater impact than the chemical discharges upon ecological functions (aquatic organism production, soil production, terrestrial organism production, etc). Furthermore, the range of the chemical discharges was incredibly diverse and impacted the environment through all media; soil, water and air. The result of this problem analysis was the realization that we would have to identify variables common to all of the diverse problems, but could still vary from one problem to the next.

RISK MATRIX

EPA Region 6

Ecological Problems

ECOLOGICAL FUNCTIONS	HYDROLOGY	O ₂ PRODUCTION CO ₂ CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION
1) Industrial Point Discharge to surface waters	O	O	X	O	X	X	X
2) POTW Discharges to surface waters	O	O	X	O	X	X	X
3) Drinking Waters, Public & Private	O	O	O	O	O	O	O
4) Non-Point Source discharges	O	O	X	O	X	X	X
5) Physical degradation of Waters & Wetlands	X	O	X	X	X	X	X
6) Other Ground-Water contamination	O	O	X	O	X	X	X
7) Storage Tanks	O	O	X	O	X	X	X
8) RCRA Hazardous Waste Sites	O	O	X	X	X	X	X
9) CERCLA Hazardous Waste Sites	O	O	X	X	X	X	X
10) Other Waste - Municipal	O	O	X	X	X	X	X
11) Other Waste - Industrial	O	O	X	X	X	X	X
12) Accidental Releases	O	O	X	X	X	X	O
13) Application of Pesticides	X	O	X	X	X	X	X
14) Sulfur & Nitrogen Oxides (Acid Deposition)	O	O	X	X	X	X	X
15) Ozone & Carbon Monoxide	O	O	X	X	X	X	X
16) Airborne Lead	O	O	X	X	X	X	X
17) Particulate Matter	O	O	X	X	X	X	X
18) Hazardous/Toxic Air Pollutants	O	O	X	X	X	X	X
19) Indoor Air Pollutants	O	O	O	O	O	O	O
20) Indoor Radon	O	O	O	O	O	O	O
21) Radiation other than Radon	O	O	O	O	O	O	O
22) Physical Degradation of Terrestrial Ecosystems/Habitat	X	O	X	X	O	X	X

Figure 1

Table 2: List of Environmental Problem Areas for Region 6 Comparative Risk Project

<u>Problem Areas</u>	<u>Type of/Stressor</u>
1. Industrial Wastewater Discharges to Oceans, Lakes and Rivers	Chemical
2. Municipal Wastewater Discharges to Oceans, Lakes and River	Chemical
3. Aggregated Public and Private Drinking Water Supplies	Chemical
4. Non-point Source Discharges to Oceans, Lakes and Rivers	Chemical
5. Physical Degradation of Water and Wetland Habitats	Physical
6. Aggregated Ground-Water Contamination	Chemical
7. Storage Tanks	Chemical
8. RCRA Hazardous Waste	Chemical
9. Hazardous Waste Sites-Abandoned/Superfund Sites	Chemical
10. Municipal Solid Waste Sites	Chemical
11. Industrial Solid Waste Sites	Chemical
12. Accidental Chemical Releases to the Environment	Chemical
13. Application of Pesticides	Chemical
14. Sulfur Oxides and Nitrogen Oxides (including Acid Deposition)	Chemical
15. Ozone and Carbon Monoxide	Chemical
16. Airborne Lead	Chemical
17. Particulate Matter	Chemical
18. Hazardous/Toxic Air Pollutants	Chemical
19. Indoor Air Pollutants other than Radon	Chemical
20. Indoor Radon	Chemical
21. Radiation other than Radon	Chemical
22. Physical Degradation of Terrestrial Ecosystems/Habitats	Physical

After a brief period of analysis, we identified at least two characteristics common to all of the problems, which could be measured or quantified. These variables were:

- a) area of impact and
- b) degree of impact.

Each of the twenty-two problems has an area of impact that can be measured or estimated for each ecoregion, and each of the problems has a degree of impact upon the environment which was recognizable (from a chronic impact, to an acute impact, to permanent elimination of ecological function on a particular site). The ecological threat can be expressed as a mathematical function of the area of impact and the degree of impact.

The mathematical function can be written as follows:

$$E_T = f(A_I, D_I)$$

where;

E_T = ecological threat of each problem upon each function within a particular ecoregion.

A_I = area of impact of each problem within a particular ecoregion.

D_I = degree of impact of each problem upon each function within a particular ecoregion.

Our initial analysis of each problem's impact upon each ecological function was incomplete; for our conceptual model did not allow for variation in the ability of each ecoregion, to withstand the impact of the various problems. We know that each ecoregion has unique characteristics that allow it to be more or less vulnerable than other ecoregions (whether it be more endangered species, more erosive soils, low stream flows, low photosynthetic rates, etc). In effect, each ecoregion has its own unique ability to bounce back (or not bounce back) when it is impacted by each of the twenty-two problems. Consequently, the same impact (in terms of area and degree of impact) may have a much more devastating effect upon the environment in one ecoregion than in another, simply due to the characteristics of the ecoregion. We revised our conceptual model to include a variable for each ecoregion that reflects its vulnerability to the problems. We call this variable, degree of vulnerability (D_V).

By including an ecoregion's degree of vulnerability (D_V) in our evaluation we are no longer just considering ecological threat (A_I and D_I); we are now dealing with a type of risk (ecological threat applied to the degree of vulnerability of an ecoregion). This risk can be expressed as an indicator number (or index) as shown below:

$$ERI = f(A_I, D_I, D_V)$$

where;

ERI = index of ecological risk, posed by the ecological threat of a specific problem to a specific ecological function.

A_I = area of impact of each problem, within a particular ecoregion.

D_I = degree of impact of each problem upon each function within a particular ecoregion.

D_V = degree of vulnerability of each function within each ecoregion.

Formulation of the Model

Identification of Variables

The variables that we have identified as being common to all twenty-two problems are area of impact and degree of impact. In addition, we recognized that each ecoregion had inherent characteristics that determined its individual vulnerability to each of the twenty-two problems. In other words, to evaluate ecological risk we are concerned with the three variables: area of impact (A_I); degree of impact (D_I); and degree of vulnerability (D_V), and how they interact.

Behavior of the Mathematical Expression

We are not developing a causal model that predicts explicitly how an individual ecosystem would react to a specific stressor. Rather, we need a mathematical expression that will assist us in ranking the relative ecological risk associated with each of the twenty-two problems in each ecoregion. The mathematical expression should incorporate the previously identified variables (A_I , D_I and D_V) and behave in manner that will facilitate ranking. Specifically, we would want the ecological risk index (ERI) to:

- a. increase as the area of impact increases
- b. increase as the degree of impact increases
- c. increase as the degree of vulnerability increases

Initial Formulation of the Mathematical Model

A formulation that achieves these objectives may be written as follows:

$$ERI = A_I / A_E \cdot D_I \cdot D_V$$

where;

ERI = ecological risk index (reflecting that it is just an indicator of risk)

A_I = area of impact by each problem per ecoregion

A_E = area of ecoregion

D_I = degree of impact of each problem on each function in each ecoregion

D_V = degree of vulnerability of each function in each ecoregion

Refinement of the Mathematical Model

To further refine the mathematical model, we applied it to a theoretical ecoregion to determine what modifications were needed. Refer to Figure 2 to facilitate review.

ECOREGION X

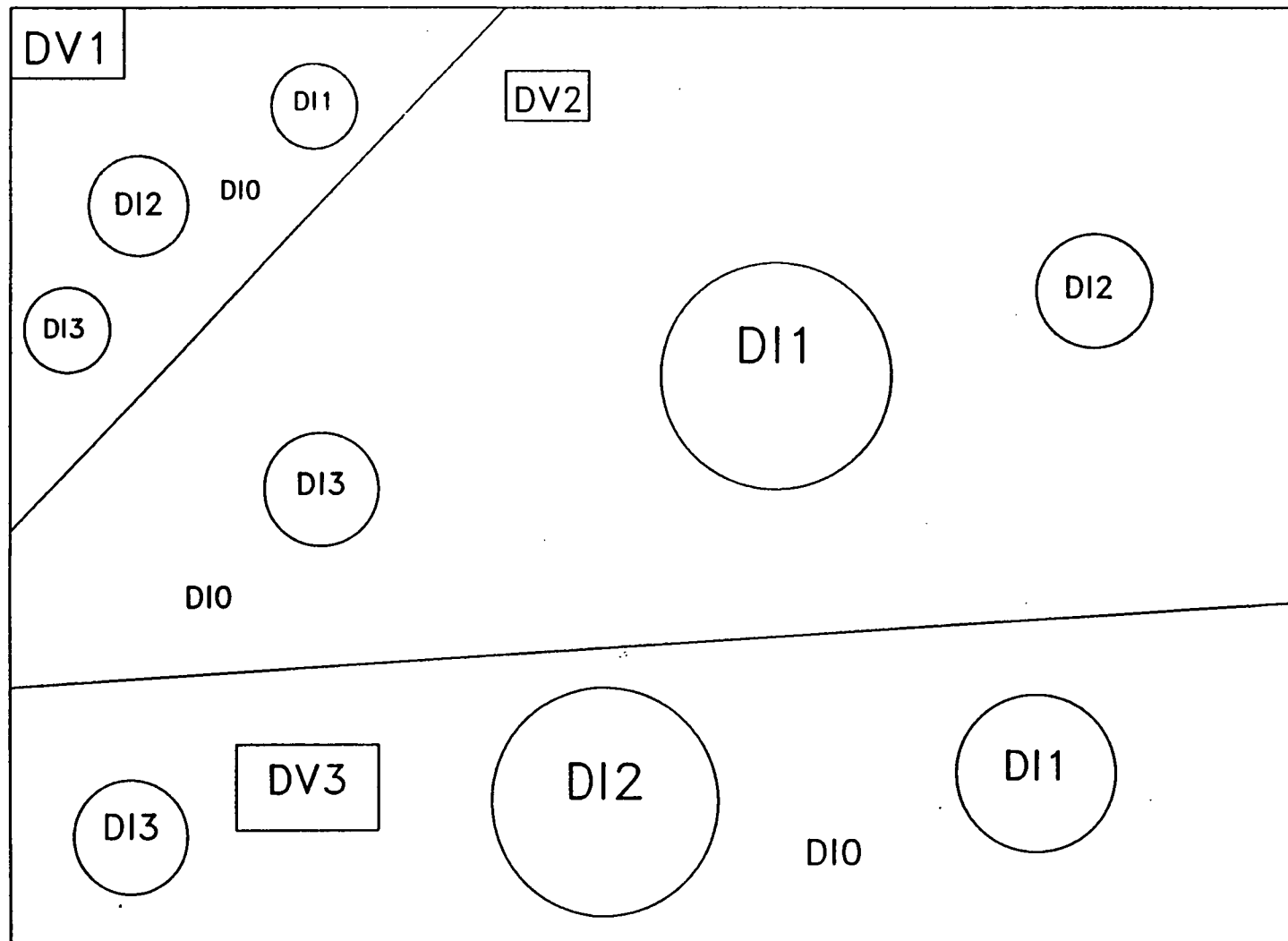


Figure 2: Degrees of Impact and Degrees of Vulnerability in a Theoretical Ecoregion.

The example we have chosen deals with the impact of hazardous air pollutants on terrestrial organism production. Within the ecoregion, there are areas of vulnerability that reflect counties containing endangered species (D_{v3}), counties containing species of special concern (D_{v2}), and counties with common species (D_{v1}). Within each of these areas of vulnerability, there can be areas with varying degrees of impact [none (D_{I0}), chronic (D_{I1}), acute (D_{I2}), and elimination (D_{I3})]. (In our particular case, we have chosen to have three degrees of vulnerability and four degrees of impact, however, the number of degrees is theoretically unlimited). The area of greatest risk should be where the problem is eliminating habitat or populations (D_{I3}) in areas with endangered species (D_{v3}); while the area of least risk is where there is a chronic threat (D_{I1}) to populations or habitat of common species (D_{v1}). In addition, if there is no discharge of air pollutant (D_{I0}), there should be no risk, regardless of the area of vulnerability.

Within each area of vulnerability, there is the possibility of four degrees of impact from the hazardous air pollutant problem (D_{I0} , D_{I1} , D_{I2} , and D_{I3}). To determine the total risk to a single vulnerability area it is necessary to sum across the degrees of impact. Expressed mathematically as follows:

$$ERI_v = \sum_{i=0}^{n-1} A_{II}/A_E \cdot D_{II} \cdot D_v$$

where;

ERI_v = ecological risk posed by all levels of air pollutant discharge within a single vulnerability area

n = number of degrees of impact (four in this case)

A_{II} = sum of area of impact for all discharges with an impact of i (in this case i is 0, 1, 2, 3)

A_E = area of ecoregion

D_{II} = degree of impact (varies with A_{II} , 0, 1, 2, 3)

D_v = degree of vulnerability

To determine total risk for the ecoregion, it is also necessary to sum across all areas of vulnerability (D_{v1} , D_{v2} , D_{v3}). The revised model to accommodate variability in degrees of impact for each problem, and variability in degrees of vulnerability for each function, can be expressed mathematically as depicted in Figure 3.

Ecological RISK INDEX FORMULA

Summation over degrees of vulnerability

Summation over degrees of impact

$$ERI = \sum_{j=1}^v \sum_{i=0}^{n-1} AI_i / AE * DI_i * DV_j$$

ERI – Ecological Risk Index

n – Number of Degrees of Impact

AI_i – Area of Impact

AE – Area of Ecoregion

DI_i – Degree of Impact

DV_j – Degree of Vulnerability

v – Number of Degrees of Vulnerability

Figure 3

IV. DATA ACQUISITION

After identification of needed input variables, (A_i , D_i and D_v), it was necessary to obtain information from each of the twenty-two program areas which regulated each of the problems of concern. Specifically, we needed to obtain information on the areas of impact for each problem within each ecoregion and information on which sites or facilities were of greatest concern and why. This was accomplished by formally requesting information from the appropriate program offices (Attachment C).

In most cases it took from one to several months to receive a response from each of the program offices due to competing priorities and limited availability of data. The information received from the programs consisted of area measurements, area estimates, number of facility estimates, estimates on zones of impact, information on program specific ranking systems and general information on which facilities or sites were of greatest concern to individual programs. These program reports varied greatly in quality, extent of information and were based in many cases on very broad assumptions and very limited data bases. When the program reports were received, they were catalogued and placed in a file for safe keeping.

As the program reports were received, they were assigned to a work group member for review and evaluation. As part of the evaluation process each work group member extracted the necessary area of impact information (Attachment D) and extent of impact information from each report. The area of impact (D_i) information was entered directly onto a data input form (Figure 4) and the extent of impact information was used to assign a degree of impact value using the method described in Attachment E. The degree of impact values were entered onto the data input forms. Values for the degree of vulnerability (D_v) were determined for each ecoregion using the methodology described in Attachment F. The appropriate vulnerability values for each ecoregion were also entered onto the data input forms.

As data input forms for each problem were completed the data were entered into a computer for calculation of ecological risk indices for each problem (Attachment G contains additional discussion of data management).

ECOREGION:

STRESSOR:

SITE OR LOCATION OF CONCERN AREA OF IMPACT

	HYDROLOGY		HYDROLOGY
	O ₂ PRODUCTION		O ₂ PRODUCTION
	SOIL PRODUCTION		SOIL PRODUCTION
	FILTERING/DETOX		FILTERING/DETOX
	AQUATIC ORGANISM		AQUATIC ORGANISM
	TERRESTRIAL ORGANISM		TERRESTRIAL ORGANISM
	PRIMARY PRODUCTION		PRIMARY PRODUCTION

V. RESULTS

Ecological Risk Posed By Each Problem

The ecological risk index values for each problem are displayed in a tabular manner as shown in Tables 3-17. Note that in each table, risk index values are presented by function for each ecoregion and that a total risk index value for each ecoregion is displayed in the right hand column of each table. The value at the bottom of the right hand column of each table represents the residual risk posed by that problem across the five state region. Thus, the aggregate residual risk index for industrial point source discharges to surface waters is 5.31 (Table 3).

Note that there are zero values listed under the oxygen production and carbon dioxide consumption function on all of the Tables (3-17). There are zero values in this column because we have been unable to decide how to evaluate this function separate from the primary production function. Nevertheless, the work group recognized oxygen production and carbon dioxide consumption as a valuable but distinct ecological function and have chosen to leave it in the matrix for further consideration at a later date. As the matrix tables are examined, the reader will note that there are frequently zero values throughout the hydrology and soil production columns and occasionally zero values throughout other columns as well. The uniform zero values are present when the work group did not believe that a specific problem would normally have an impact upon a specific function (refer to Figure 1).

Working across each matrix table, a value in a column simply indicates that function is at risk in that ecoregion due to the problem described at the top of the page. The magnitude of the risk index value is the value derived from utilizing the risk index equation (Figure 3). The area of impact values, degree of impact values, and vulnerability values that were used to calculate the risk index values for each problem, are included in Attachment H.

Ranking Of Residual Ecological Risk

When the ecological risk index value for each problem is taken from the bottom of Tables 3-17 and ranked in an ordinal manner the result is that depicted in Table 18. Note that the range of risk index values varies from Application of Pesticides with a value of 81.90 to Airborne Lead with a value of 0.01.

Distribution Of Residual Ecological Risk Per Problem

The information contained in Tables 3-17 can be readily mapped to visually display the distribution of residual risk posed by each problem. The range of values in the right hand column of each table represents the range in residual risk posed by the problem identified at the top of each table. Each value in the in the right hand column correlates with an ecoregion identified in the left hand column of each table.

To visually portray the distribution of risk for each problem, the range of values in the right hand column was determined and divided by four. This identified four categories of residual risk. A fifth category representing no known residual risk was also added. A color sequence

was then identified for each of the five categories of risk. Shades of blue were used to depict relative levels of risk within each water problem. Shades of pink and red were used to depict relative levels of residual risk within each air problem. Shades of green to yellow were used to depict relative levels of residual risk caused by physical degradation problems. Shades of purple and lavender were used to depict relative levels of residual risk caused by waste problems. Shades of orange to red were used to depict relative levels of residual risk caused by the application of pesticides.

The visual depiction of residual risk posed by each environmental problem is shown in Maps 2-16.

Residual Ecological Risk Per Ecoregion

Ecological risk index values for problems within each ecoregion are displayed in a tabular manner as shown in Tables 19-40. In each table, risk index values are presented by function for each problem and a total risk index value for each ecoregion is presented at the bottom of the table. For example, the aggregated residual risk index for the Central Texas Plateau is 2.37 (Table 19). The range of risk index values varies from 2.37 to 40.61. As in the previous set of tables (3-17), there are zero values listed under the oxygen production and carbon dioxide consumption function. There are also zero values throughout the tables where problems are not likely to impair ecological functions. A value in a column indicates that problem is present in the ecoregion and that the problem has the potential to impair that ecological function. The magnitude of the risk index value is derived from utilization of the risk index equation (Figure 3).

The values in the right hand column of each table represent the total ecological risk posed by each problem in the ecoregion.

Distribution of Ecological Risk Per Ecoregion

When the input data for all thirteen sets of data (one for each problem) are combined, it is possible to calculate the aggregate or cumulative ecological risk posed by all thirteen problems to each ecoregion (Table 41). The risk index values are presented by function per ecoregion, with the values in the right column representing the total residual ecological risk posed by all the evaluated problems. The information from the right hand column can be visually portrayed (Map 17) to show which ecoregions are at greatest residual risk and which ecoregions are at least residual risk due to the cumulative impact of all evaluated problems.

TABLE 3

RISK MATRIX - EPA Region 6
for the Industrial Point Discharge to Surface Waters (1) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.03515	0.00000	0.00901	0.01757	0.02343	0.08517
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.01855	0.00000	0.00309	0.00927	0.01236	0.04328
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31) SOUTHERN TEXAS PLAINS, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.17245	0.00000	0.02874	0.05748	0.08622	0.34489
34) WESTERN GULF COASTAL PLAIN, TX & LA		-0.00000	0.00000	0.48356	0.00000	0.21064	0.16119	0.24178	1.09717
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.20367	0.00000	0.04505	0.04526	0.04526	0.33924
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.02332	0.00000	0.01166	0.00777	0.00389	0.04663
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.29657	0.00000	0.03295	0.16476	0.09886	0.59313
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	1.00544	0.00000	0.23072	0.16757	0.16757	1.57130
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.37492	0.00000	0.18746	0.06249	0.06249	0.68735
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.28502	0.00000	0.07465	0.04750	0.09501	0.50218
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	2.89864	0.00000	0.83397	0.74087	0.83687	5.31035

The ecological Risk Index Value for this problem is 5.31035
 (This number is determined by adding the RI totals for Ecological Regions)

TABLE 4

RISK MATRIX - EPA Region 6
for the POTW Discharges to Surface Waters (2) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.08440	0.00000	0.00563	0.02251	0.01688	0.12942
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.33427	0.00000	0.11421	0.08914	0.11142	0.64904
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.08135	0.00000	0.02712	0.02712	0.01627	0.15185
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.43093	0.00000	0.02873	0.11491	0.14364	0.71821
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.09993	0.00000	0.01110	0.01110	0.04441	0.16655
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.05433	0.00000	0.01032	0.02717	0.03622	0.12804
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.06934	0.00000	0.01156	0.03467	0.04622	0.16178
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31) SOUTHERN TEXAS PLAINS, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	1.09976	0.00000	0.11359	0.14663	0.29327	1.65325
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.58764	0.00000	0.09794	0.19588	0.29382	1.17529
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.99024	0.00000	0.31117	0.33008	0.49512	2.12662
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.52271	0.00000	0.07165	0.11616	0.11616	0.82667
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.06703	0.00000	0.03352	0.02234	0.01117	0.13407
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.05166	0.00000	0.01722	0.01148	0.01148	0.09184
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.26367	0.00000	0.02930	0.14649	0.08789	0.52735
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	1.47173	0.00000	0.30843	0.47843	0.32300	2.58160
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.36312	0.00000	0.07953	0.06052	0.06052	0.56369
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.36646	0.00000	0.06108	0.06108	0.12215	0.61076
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	6.93858	0.00000	1.33208	1.89571	2.22967	12.39603

The ecological Risk Index Value for this problem is 12.39603
(This number is determined by adding the RI totals for Ecological Regions)

TABLE 5

RISK MATRIX - EPA Region 6
for the Non-point Source discharges (4) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
1) SOUTHERN ROCKIES, NM		0.00000	0.00000	4.08534	0.00000	0.34207	1.08942	0.61707	6.33390
2) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	3.49272	0.00000	0.55188	0.93139	1.16424	6.14024
3) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	1.56852	0.00000	0.53544	0.52284	0.31370	2.94050
4) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.65726	0.00000	0.04382	0.17527	0.21909	1.09544
5) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.19095	0.00000	0.06365	0.02122	0.08487	0.36069
6) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.58355	0.00000	0.07553	0.06484	0.25935	0.98327
7) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.49082	0.00000	0.08389	0.24541	0.32721	1.14732
8) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
9) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.02277	0.00000	0.00379	0.01138	0.01518	0.05313
10) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) SOUTHERN TEXAS PLAINS, TX		-0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	0.50885	0.00000	0.06785	0.06785	0.13569	0.78023
13) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.30908	0.00000	0.08910	0.10303	0.15454	0.65574
14) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.51067	0.00000	0.23626	0.17022	0.25533	1.17248
15) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.18890	0.00000	0.02099	0.04198	0.04198	0.29385
16) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.54791	0.00000	0.06088	0.18264	0.12176	0.91319
17) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	1.06788	0.00000	0.18381	0.35596	0.17798	1.78562
18) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.15700	0.00000	0.01744	0.05233	0.03489	0.26167
19) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.00916	0.00000	0.00102	0.00204	0.00204	0.01425
20) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.96504	0.00000	0.14531	0.53613	0.32168	1.96815
21) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	1.54459	0.00000	0.32057	0.52701	0.34729	2.73946
22) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	1.92564	0.00000	0.40790	0.32094	0.32094	2.97542
23) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	1.23782	0.00000	0.23345	0.20630	0.41261	2.09017
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	20.06444	0.00000	3.48465	5.62819	5.52743	34.70471

The ecological Risk Index Value for this problem is 34.70471
 (This number is determined by adding the RI totals for Ecological Regions)

TABLE 6

RISK MATRIX - EPA Region 6
for the Physical Degradation of Water & Wetlands (5) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.13346	0.00000	0.08341	0.03336	0.06673	0.13346	0.12512	0.57554
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.15075	0.00000	0.09422	0.03769	0.18843	0.18843	0.08479	0.74431
24) SOUTHERN DESERTS, NM & TX		0.15041	0.00000	0.07521	0.03008	0.03008	0.12033	0.11281	0.51893
25) WESTERN HIGH PLAINS, NM & TX		0.26378	0.00000	0.11755	0.08356	0.06007	0.06007	0.21681	0.80185
26) SOUTHWESTERN TABLELANDS, TX & OK		0.15394	0.00000	0.07697	0.10263	0.05131	0.05131	0.15394	0.59012
27) CENTRAL GREAT PLAINS, TX & OK		0.16659	0.00000	0.05553	0.16659	0.05553	0.16659	0.16659	0.77741
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.16382	0.00000	0.08191	0.24573	0.08191	0.24573	0.24573	1.06485
30) CENTRAL TEXAS PLATEAU, TX		0.15733	0.00000	0.07867	0.15733	0.05244	0.10489	0.11800	0.66867
31) SOUTHERN TEXAS PLAINS, TX		0.20962	0.00000	0.12354	0.17216	0.06987	0.06987	0.17595	0.82102
32) TEXAS BLACKLAND PRAIRIES, TX		0.17764	0.00000	0.08882	0.35529	0.08882	0.17764	0.26647	1.15469
33) EAST CENTRAL TEXAS PLAINS, TX		0.50891	0.00000	0.25446	1.01783	0.25446	0.50891	0.57253	3.11710
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.90162	0.00000	0.87682	3.85804	0.90162	2.53204	2.13941	11.20955
35) SOUTH CENTRAL PLAINS, TX, LA & AR		1.01712	0.00000	0.76284	2.03424	0.50856	1.01712	0.76284	6.10272
36) OUACHITA MOUNTAINS, AR & OK		0.55538	0.00000	0.41653	1.11075	0.27769	0.83306	0.41653	3.60994
37) ARKANSAS VALLEY, AR & OK		0.36543	0.00000	0.36543	1.09630	0.36543	0.73087	0.27408	3.19755
38) BOSTON MOUNTAINS, AR & OK		0.43645	0.00000	0.65467	1.30934	0.43645	1.30934	0.65467	4.80091
39) OZARK HIGHLANDS, AR & OK		0.29687	0.00000	0.44530	0.89060	0.29687	0.59373	0.44530	2.96867
40) CENTRAL IRREGULAR PLAINS, OK		0.08140	0.00000	0.12210	0.24419	0.08140	0.40698	0.18314	1.11921
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.95110	0.00000	0.88942	5.06503	0.95121	1.01301	0.79065	9.66041
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		6.84162	0.00000	5.66340	18.01075	4.81889	10.26341	7.90536	53.50343

The ecological Risk Index Value for this problem is 53.50343
 (This number is determined by adding the RI totals for Ecological Regions)

TABLE 7

RISK MATRIX - EPA Region 6
for the RCRA Hazardous Waste Sites (8) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.03788	0.00762	0.01523	0.03047	0.03808	0.12928
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00778	0.00156	0.00782	0.00782	0.00469	0.02968
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.03103	0.00624	0.00624	0.02496	0.03120	0.09968
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.04040	0.02708	0.01354	0.01354	0.05417	0.14874
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.00225	0.00151	0.00076	0.00076	0.00302	0.00830
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.01721	0.02596	0.00865	0.02596	0.03462	0.11241
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.03205	0.04834	0.01611	0.04834	0.06445	0.20929
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.01784	0.01793	0.00598	0.01196	0.01793	0.07164
31) SOUTHERN TEXAS PLAINS, TX		0.00000	0.00000	0.01145	0.01152	0.00384	0.00384	0.01152	0.04216
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	0.27815	0.22375	0.05594	0.11187	0.22375	0.89345
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.02517	0.05061	0.01265	0.02530	0.03796	0.15169
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.27861	0.56028	0.14007	0.28014	0.42021	1.67931
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.08340	0.11182	0.02795	0.05591	0.05591	0.33499
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.03855	0.05168	0.01292	0.03876	0.02584	0.16774
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.01578	0.02380	0.00793	0.01587	0.00793	0.07132
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.03940	0.03962	0.01321	0.02641	0.02641	0.14505
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.12357	0.12425	0.04142	0.20708	0.12425	0.62057
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.03703	0.09308	0.01862	0.07446	0.03723	0.26041
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.05669	0.14252	0.02850	0.02850	0.02850	0.28472
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.13594	0.34171	0.06834	0.06834	0.13668	0.75102
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	1.31018	1.91087	0.50573	1.10030	1.38436	6.21144

The ecological Risk Index Value for this problem is 6.21144
(This number is determined by adding the RI totals for Ecological Regions)

TABLE 8

RISK MATRIX - EPA Region 6
for the CERCLA Hazardous Waste Sites (9) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.00366	0.00073	0.00147	0.00293	0.00366	0.01246
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00173	0.00035	0.00173	0.00173	0.00104	0.00657
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.00038	0.00025	0.00013	0.00013	0.00051	0.00139
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.00306	0.00459	0.00153	0.00459	0.00612	0.01990
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.00065	0.00097	0.00032	0.00097	0.00130	0.00422
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31) SOUTHERN TEXAS PLAINS, TX		-0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.00033	0.00067	0.00017	0.00033	0.00050	0.00201
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.00343	0.00686	0.00172	0.00343	0.00515	0.02059
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.00418	0.00558	0.00139	0.00279	0.00279	0.01674
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.00372	0.00496	0.00124	0.00372	0.00248	0.01613
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.00088	0.00133	0.00044	0.00088	0.00044	0.00398
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.00010	0.00226	0.00075	0.00226	0.00151	0.00688
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.05160	0.05160	0.01720	0.08599	0.05160	0.25798
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.00441	0.01103	0.00221	0.00883	0.00441	0.03090
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.00190	0.00476	0.00095	0.00095	0.00095	0.00951
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	0.08005	0.09594	0.03125	0.11954	0.08246	0.40924

The ecological Risk Index Value for this problem is 0.40924
(This number is determined by adding the RI totals for Ecological Regions)

TABLE 9

RISK MATRIX - EPA Region 6
for the Accidental Releases (12) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.01021	0.00000	0.01021
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.03170	0.00534	0.00934	0.02536	0.00000	0.07173
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.01370	0.00274	0.01370	0.01370	0.00000	0.04385
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.02188	0.00401	0.00401	0.01750	0.00000	0.04740
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.04821	0.02373	0.01187	0.01607	0.00000	0.09988
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.02682	0.01589	0.00795	0.00894	0.00000	0.05959
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.01463	0.00488	0.00433	0.02519	0.00000	0.04903
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.03784	0.05253	0.01694	0.05676	0.00000	0.16408
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.01259	0.01259	0.00420	0.00839	0.00000	0.03776
31) SOUTHERN TEXAS PLAINS, TX		-0.00000	0.00000	0.03704	0.03704	0.01235	0.01235	0.00000	0.09878
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	0.35784	0.30691	0.07673	0.15345	0.00000	0.89493
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.03571	0.07142	0.01786	0.03571	0.00000	0.16070
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.45027	0.93745	0.23575	0.47149	0.00000	2.09496
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.06980	0.09110	0.02718	0.05437	0.00000	0.24246
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.04080	0.05440	0.01813	0.05440	0.00000	0.16775
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.02436	0.01566	0.01218	0.02088	0.00000	0.07309
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.01309	0.00000	0.00436	0.00873	0.00000	0.02619
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.03476	0.03476	0.01593	0.02317	0.00000	0.10861
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.41117	0.40512	0.13504	0.68528	0.00000	1.63660
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.14700	0.39605	0.08099	0.08171	0.00000	0.70575
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.63808	1.59520	0.31904	0.31904	0.00000	2.87136
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	2.46728	4.06681	1.02789	2.10271	0.00000	9.66469

The ecological Risk Index Value for this problem is 9.66469
(This number is determined by adding the RI totals for Ecological Regions)

TABLE 10

RISK MATRIX - EPA Region 6
for the Application of Pesticides (13) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24) SOUTHERN DESERTS, NM & TX		0.02918	0.00000	0.08755	0.01167	0.02335	0.14008	0.02918	0.32101
25) WESTERN HIGH PLAINS, NM & TX		1.28233	0.00000	2.30819	1.02586	1.02586	1.53879	1.02586	8.20689
26) SOUTHWESTERN TABLELANDS, TX & OK		0.23021	0.00000	0.69064	0.30695	0.30695	0.46043	0.30695	2.30214
27) CENTRAL GREAT PLAINS, TX & OK		0.94515	0.00000	1.89030	1.89030	1.26020	5.67089	1.26020	12.91702
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.21153	0.00000	0.63459	0.63459	0.42306	1.90378	0.42306	4.23062
30) CENTRAL TEXAS PLATEAU, TX		0.10134	0.00000	0.30403	0.20268	0.13512	0.40537	0.10134	1.24989
31) SOUTHERN TEXAS PLAINS, TX		-0.24837	0.00000	0.74511	0.49674	0.33116	0.49674	0.24837	2.56648
32) TEXAS BLACKLAND PRAIRIES, TX		0.39072	0.00000	1.75825	1.56289	0.78145	2.34434	0.78145	7.61910
33) EAST CENTRAL TEXAS PLAINS, TX		0.17009	0.00000	0.51026	0.68035	0.34017	1.02052	0.25513	2.97653
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.15545	0.00000	0.93270	1.24360	0.62180	2.79809	0.46635	6.21798
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.08528	0.00000	0.38376	0.34112	0.17056	0.51167	0.08528	1.57766
36) OUACHITA MOUNTAINS, AR & OK		0.07585	0.00000	0.34134	0.30342	0.15171	0.68269	0.07585	1.63086
37) ARKANSAS VALLEY, AR & OK		0.06828	0.00000	0.40968	0.40968	0.27312	0.81936	0.06828	2.04839
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.04460	0.00000	0.40142	0.26761	0.17841	0.53523	0.08920	1.51648
40) CENTRAL IRREGULAR PLAINS, OK		0.19329	0.00000	1.73960	1.15973	0.77315	5.79866	0.57987	10.24430
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.35385	0.00000	2.12310	3.53849	5.66159	4.24619	0.35385	16.27707
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		4.58553	0.00000	15.26051	14.07569	12.45766	29.37282	6.15023	81.90243

The ecological Risk Index Value for this problem is 81.90243
(This number is determined by adding the RI totals for Ecological Regions)

TABLE 11

RISK MATRIX - EPA Region 6
for the Ozone & Carbon Monoxide (15) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.15503	0.03101	0.06201	0.12403	0.15503	0.52712
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.14565	0.02913	0.02913	0.11652	0.14565	0.46607
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.03037	0.04556	0.01519	0.04556	0.06075	0.19742
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.15802	0.23703	0.07901	0.23703	0.31604	1.02712
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31) SOUTHERN TEXAS PLAINS, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	0.37947	0.75893	0.18973	0.37947	0.75893	2.46653
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.05066	0.10132	0.02533	0.05066	0.07599	0.30395
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.71137	1.42274	0.35568	0.91148	1.36722	4.76849
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.06484	0.08646	0.02161	0.04323	0.04323	0.25938
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.10858	0.27144	0.05429	0.08143	0.08143	0.59717
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.91297	2.28243	0.45649	0.91297	1.82594	6.39079
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	2.71696	5.26604	1.28847	2.90237	4.83020	17.00404

The ecological Risk Index Value for this problem is 17.00404
(This number is determined by adding the RI totals for Ecological Regions)

TABLE 12

RISK MATRIX - EPA Region 6
for the Airborne Lead (16) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O ₂ PRODUCTION CO ₂ CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31) SOUTHERN TEXAS PLAINS, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	0.00150	0.00300	0.00075	0.00150	0.00300	0.00974
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
36) QUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.00028	0.00069	0.00014	0.00014	0.00014	0.00138
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	0.00178	0.00369	0.00089	0.00164	0.00314	0.01113

The ecological Risk Index Value for this problem is 0.01113
(This number is determined by adding the RI totals for Ecological Regions)

TABLE 13

RISK MATRIX - EPA Region 6
for the Particulate Matter (17) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.01698	0.00340	0.00679	0.01358	0.01698	0.05772
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.01841	0.00368	0.00368	0.01473	0.01841	0.05891
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.00631	0.00420	0.00000	0.00210	0.00841	0.02102
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31) SOUTHERN TEXAS PLAINS, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	0.04169	0.01128	0.01047	0.03041	0.04379	0.13765

The ecological Risk Index Value for this problem is 0.13765
(This number is determined by adding the RI totals for Ecological Regions)

TABLE 14

RISK MATRIX - EPA Region 6
for the Hazardous/Toxic Air Pollutants (18) Problem, FY90
Ecological Risk Index

ECOLOGICAL REGIONS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL REGIONS RI TOTAL
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.12679	0.02536	0.05071	0.10143	0.12679	0.43107
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.06199	0.01240	0.01240	0.04959	0.06199	0.19836
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.07713	0.05142	0.02571	0.02571	0.10284	0.28282
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.03178	0.02119	0.01059	0.01059	0.04238	0.11653
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.06934	0.10402	0.03467	0.10402	0.13869	0.45074
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.33211	0.49816	0.16605	0.49816	0.66421	2.15869
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31) SOUTHERN TEXAS PLAINS, TX		0.00000	0.00000	0.04041	0.04041	0.01347	0.01347	0.04041	0.14817
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	1.01098	2.02197	0.50549	0.50549	2.02197	6.06591
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.07388	0.14777	0.03694	0.07388	0.11083	0.44330
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	1.12937	2.25874	0.56468	1.12937	1.69405	6.77621
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.42613	0.56818	0.14204	0.28409	0.28409	1.70454
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.88407	1.17876	0.29469	0.88407	0.58938	3.83096
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.37588	0.49856	0.18794	0.37588	0.18794	1.62618
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.47136	0.47136	0.15712	0.47136	0.31424	1.88545
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.59084	0.59084	0.19695	0.39389	0.39389	2.16641
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	1.71723	1.71723	0.57241	2.86204	1.71723	8.58613
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.13047	0.32618	0.06524	0.19571	0.13047	0.84806
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.45671	1.14177	0.22835	0.22835	0.22835	2.28353
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	1.07676	2.69190	0.53838	0.53838	1.07676	5.92217
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	9.08322	14.36618	3.80384	8.74548	9.92650	45.92523

The ecological Risk Index Value for this problem is 45.92523
(This number is determined by adding the RI totals for Ecological Regions)

TABLE 15

RISK MATRIX - EPA Region 6
for the Physical Degradation of Terrestrial Ecosystems/Habitat (22) Problem
(Silviculture)

Ecological Regions	Ecological Functions	Hydrology	O2 Production CO2 Production	Filtering/ Detoxifying Pollutants	Soil Production	Fisheries Production	Wildlife Production	Photosynthetic Production	Ecological Regions RI Total
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31) SOUTHERN TEXAS PLAINS, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	3.92106	4.60817	0.00000	2.92399	0.00000	11.45322
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	2.22104	2.52774	0.00000	2.54627	0.00000	7.29504
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	1.07368	1.57463	0.00000	1.09761	0.00000	3.74592
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	2.03585	2.03585	0.00000	2.08626	0.00000	6.15796
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	1.40117	1.35099	0.00000	0.96756	0.00000	3.71972
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
65) Southeastern Plains, LA (ALSO 75 - Southern Coastal Plains)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	0.67342	1.58256	0.00000	0.35691	0.00000	2.61289
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ecological Function -- RI Totals		0.00000	0.00000	11.32621	13.67994	0.00000	9.97859	0.00000	34.98475

The ecological Risk Index Value for this problem is 34.98475
 (This number is determined by adding the RI totals for Ecological Regions)

TABLE 16

RISK MATRIX - EPA Region 6
for the Physical Degredation of Terrestrial Ecosystems/Habitat (22) Pr
Ecological Risk Index
(Urbanization)

Ecological Regions	Ecological Functions	Hydrology	O2 Production CO2 - CONSUMPTION	Filtering/ Detoxifying Pollutants	Soil Production	Fisheries Production	WILDLIFE Production	PRIMARY Production	Ecological Regions RI Total
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.16656	0.00000	0.15615	0.02082	0.00000	0.16656	0.20820	0.71828
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24) SOUTHERN DESERTS, NM & TX		0.03034	0.00000	0.02275	0.00303	0.00000	0.02427	0.03034	0.11073
25) WESTERN HIGH PLAINS, NM & TX		0.16613	0.00000	0.07476	0.03323	0.00000	0.03323	0.13290	0.44024
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27) CENTRAL GREAT PLAINS, TX & OK		0.08191	0.00000	0.04096	0.04096	0.00000	0.08191	0.10922	0.35495
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.02856	0.00000	0.02142	0.02142	0.00000	0.04283	0.05711	0.17134
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
31) SOUTHERN TEXAS PLAINS, TX		0.07489	0.00000	0.05617	0.03745	0.00000	0.02496	0.07489	0.26836
32) TEXAS BLACKLAND PRAIRIES, TX		0.95486	0.00000	1.79037	0.95486	0.00000	0.95486	1.90973	6.56469
33) EAST CENTRAL TEXAS PLAINS, TX		0.05004	0.00000	0.03753	0.05004	0.00000	0.05004	0.07507	0.26273
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.11648	0.00000	0.17472	0.23296	0.00000	0.23296	0.34944	1.10656
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.06630	0.00000	0.07459	0.06630	0.00000	0.06630	0.06630	0.33979
36) OUACHITA MOUNTAINS, AR & OK		0.13275	0.00000	0.14934	0.13275	0.00000	0.19912	0.13275	0.74670
37) ARKANSAS VALLEY, AR & OK		0.05123	0.00000	0.07685	0.07685	0.00000	0.10246	0.05123	0.35861
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.01112	0.00000	0.02502	0.01668	0.00000	0.03336	0.02224	0.10844
40) CENTRAL IRREGULAR PLAINS, OK		0.09675	0.00000	0.21768	0.14512	0.00000	0.48373	0.29024	1.23350
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.04967	0.00000	0.07450	0.12417	0.00000	0.04967	0.04967	0.34767
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ecological Function -- RI Totals		2.07758	0.00000	2.99280	1.95663	0.00000	2.54627	3.55932	13.13260

The ecological Risk Index Value for this problem is 13.13260
 (This number is determined by adding the RI totals for Ecological Regions)

TABLE 17

RISK MATRIX - EPA Region 6
for the Physical Degredation of Terrestrial Ecosystems/Habitat (22) Problem
Ecological Risk Index
(Agriculture)

Ecological Regions	Ecological Functions	Hydrology	O2 Production CO2 - CONSUMPTION	Filtering/ Detoxifying Pollutants	Soil Production	Fisheries Production	WILDLIFE Production	PRIMARY Production	Ecological Regions RI Total
21) SOUTHERN ROCKIES, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24) SOUTHERN DESERTS, NM & TX		0.00000	0.00000	0.05837	0.00000	0.00000	0.07004	0.00000	0.12840
25) WESTERN HIGH PLAINS, NM & TX		0.00000	0.00000	1.53879	0.00000	0.00000	0.51293	0.00000	2.05172
26) SOUTHWESTERN TABLELANDS, TX & OK		0.00000	0.00000	0.46043	0.00000	0.00000	0.15348	0.00000	0.61390
27) CENTRAL GREAT PLAINS, TX & OK		0.00000	0.00000	1.26020	0.00000	0.00000	1.89030	0.00000	3.15049
28) FLINT HILLS, OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.00000	0.00000	0.42306	0.00000	0.00000	0.63459	0.00000	1.05765
30) CENTRAL TEXAS PLATEAU, TX		0.00000	0.00000	0.20268	0.00000	0.00000	0.13512	0.00000	0.33781
31) SOUTHERN TEXAS PLAINS, TX		0.00000	0.00000	0.49674	0.00000	0.00000	0.16558	0.00000	0.66232
32) TEXAS BLACKLAND PRAIRIES, TX		0.00000	0.00000	1.95362	0.00000	0.00000	0.78145	0.00000	2.73506
33) EAST CENTRAL TEXAS PLAINS, TX		0.00000	0.00000	0.34017	0.00000	0.00000	0.34017	0.00000	0.68035
34) WESTERN GULF COASTAL PLAIN, TX & LA		0.00000	0.00000	0.62180	0.00000	0.00000	0.62180	0.00000	1.24360
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.00000	0.00000	0.48911	0.31103	0.00000	0.32607	0.15551	1.28173
36) OUACHITA MOUNTAINS, AR & OK		0.00000	0.00000	0.22756	0.00000	0.00000	0.22756	0.00000	0.45512
37) ARKANSAS VALLEY, AR & OK		0.00000	0.00000	0.27312	0.00000	0.00000	0.27312	0.00000	0.54624
38) BOSTON MOUNTAINS, AR & OK		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39) OZARK HIGHLANDS, AR & OK		0.00000	0.00000	0.26761	0.00000	0.00000	0.17841	0.00000	0.44602
40) CENTRAL IRREGULAR PLAINS, OK		0.00000	0.00000	1.15973	0.00000	0.00000	1.93289	0.00000	3.09262
65) SOUTHEASTERN PLAINS, LA (65 & 75)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.00000	0.00000	1.58738	0.42995	0.00000	1.50139	0.08599	3.60470
74) MISSISSIPPI VALLEY LOESS PLAIN		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Ecological Function -- RI Totals		0.00000	0.00000	11.36037	0.74098	0.00000	9.74489	0.24150	22.08774

The ecological Risk Index Value for this problem is 22.08774
 (This number is determined by adding the RI totals for Ecological Regions)

Table 18 Region 6 Ordinal Ranking Of Environmental Problems Which Pose Residual Risk To Ecoregions

<u>Ordinal Ranking</u>	<u>Environmental Problem</u>	<u>Ecological Risk Index Value</u>
1	Application of Pesticides	81.90
2	Physical Degradation of Terrestrial Ecosystems/Habitats	70.20
3	Physical Degradation of Water and Wetlands	53.50
4	Toxic Air Pollutants	45.92
5	Non-Point Source Discharges	34.70
6	Ozone and Carbon Monoxide	17.00
7	POTW Discharges to Surface Waters	12.40
8	Accidental Releases	9.66
9	RCRA Waste Sites	6.21
10	Industrial Discharges to Surface Waters	5.31
11	CERCLA Waste Sites	0.41
12	Particulate Matter	0.14
13	Airborne Lead	0.01

MAPS

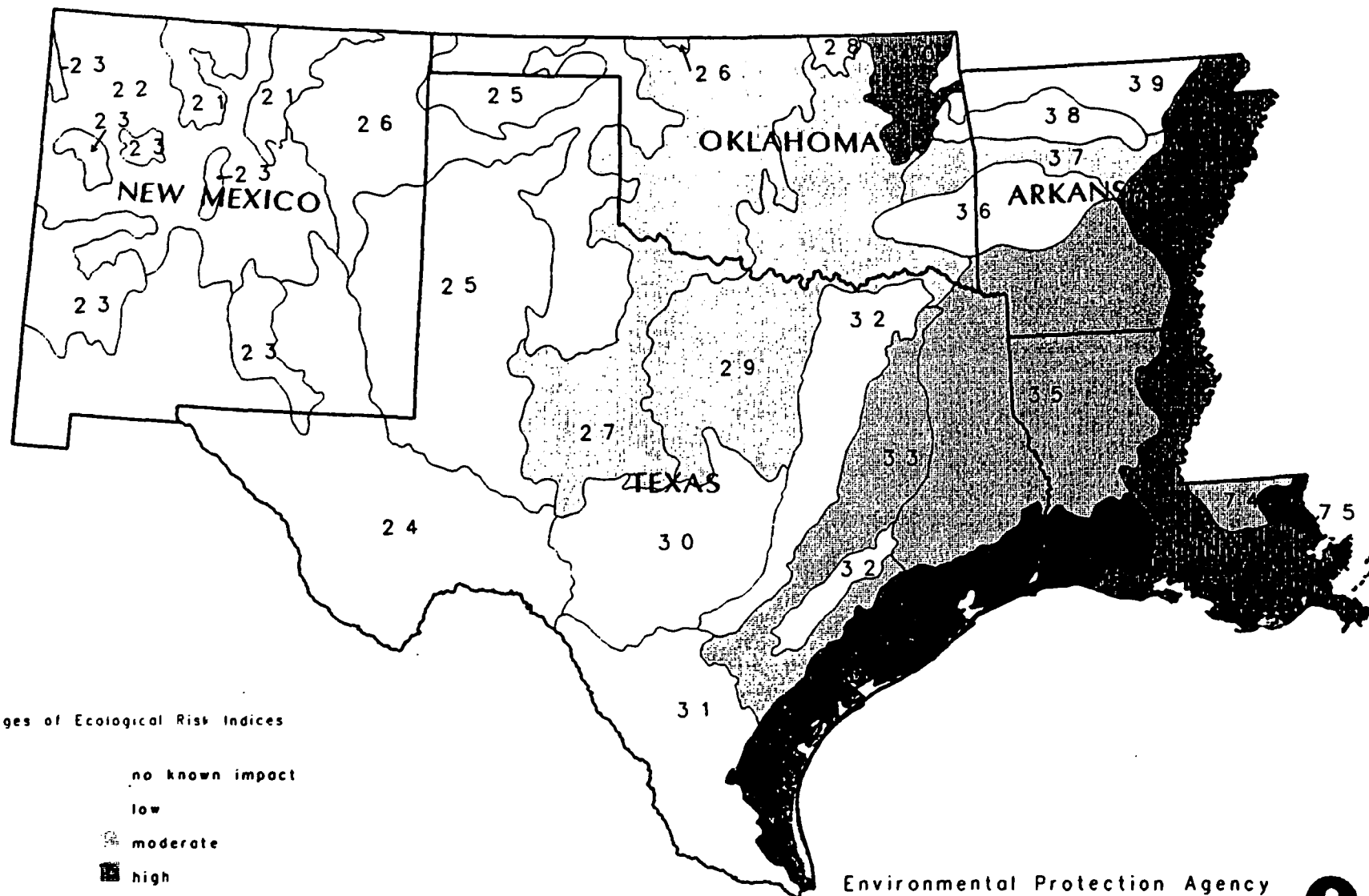
MAP LEGEND

- | | |
|------------------------------------|---|
| 21) Southern Rockies, NM | 33) East Central Texas Plains |
| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 2

Industrial Point Source Discharge Distribution of Ecological Risk per Ecoregion



Ranges of Ecological Risk Indices

- no known impact
- low
- moderate
- high
- higher

Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



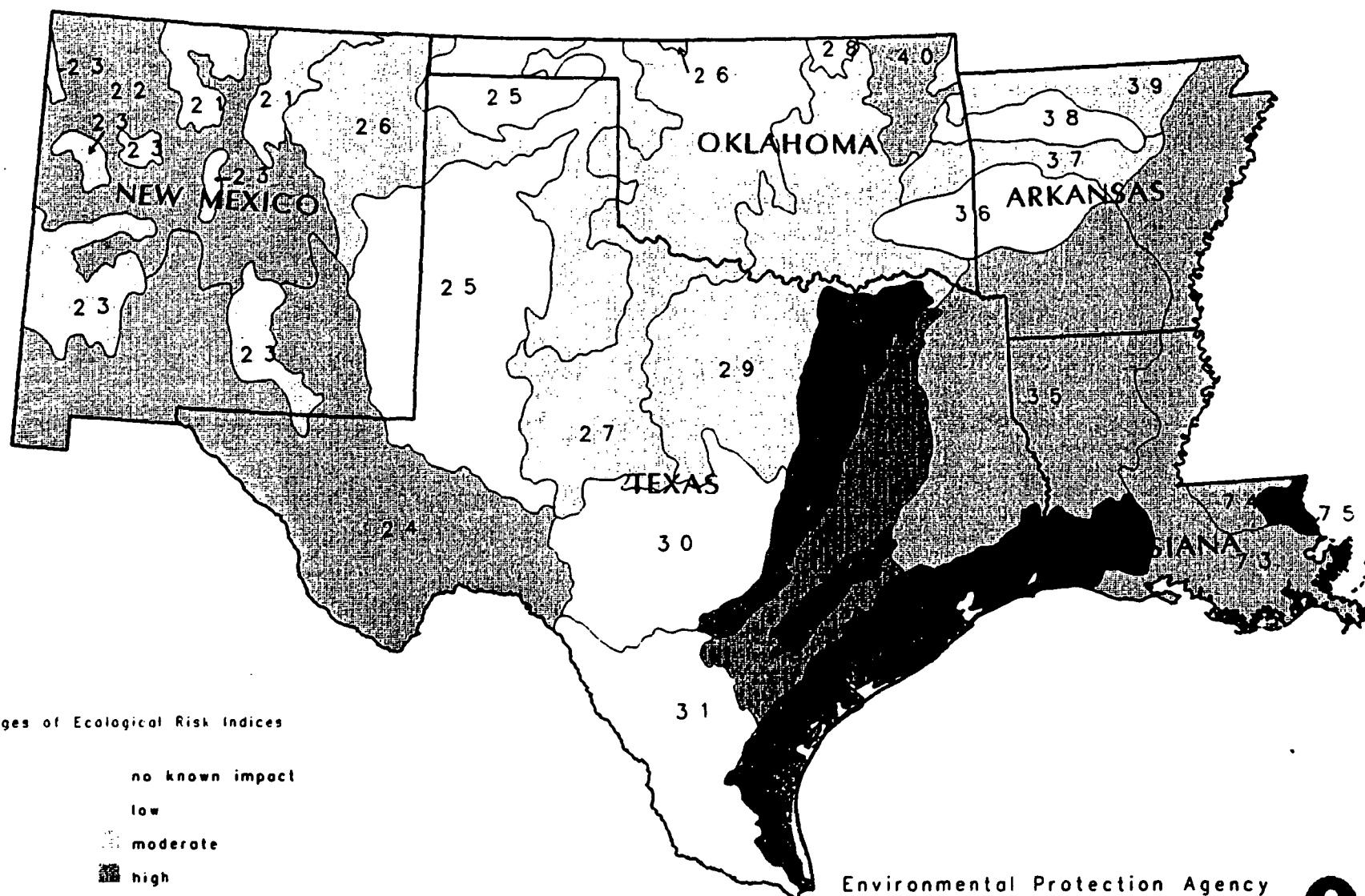
MAP LEGEND

- | | |
|------------------------------------|---|
| 21) Southern Rockies, NM | 33) East Central Texas Plains |
| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

POTW Discharge

Distribution of Ecological Risk per Region



Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



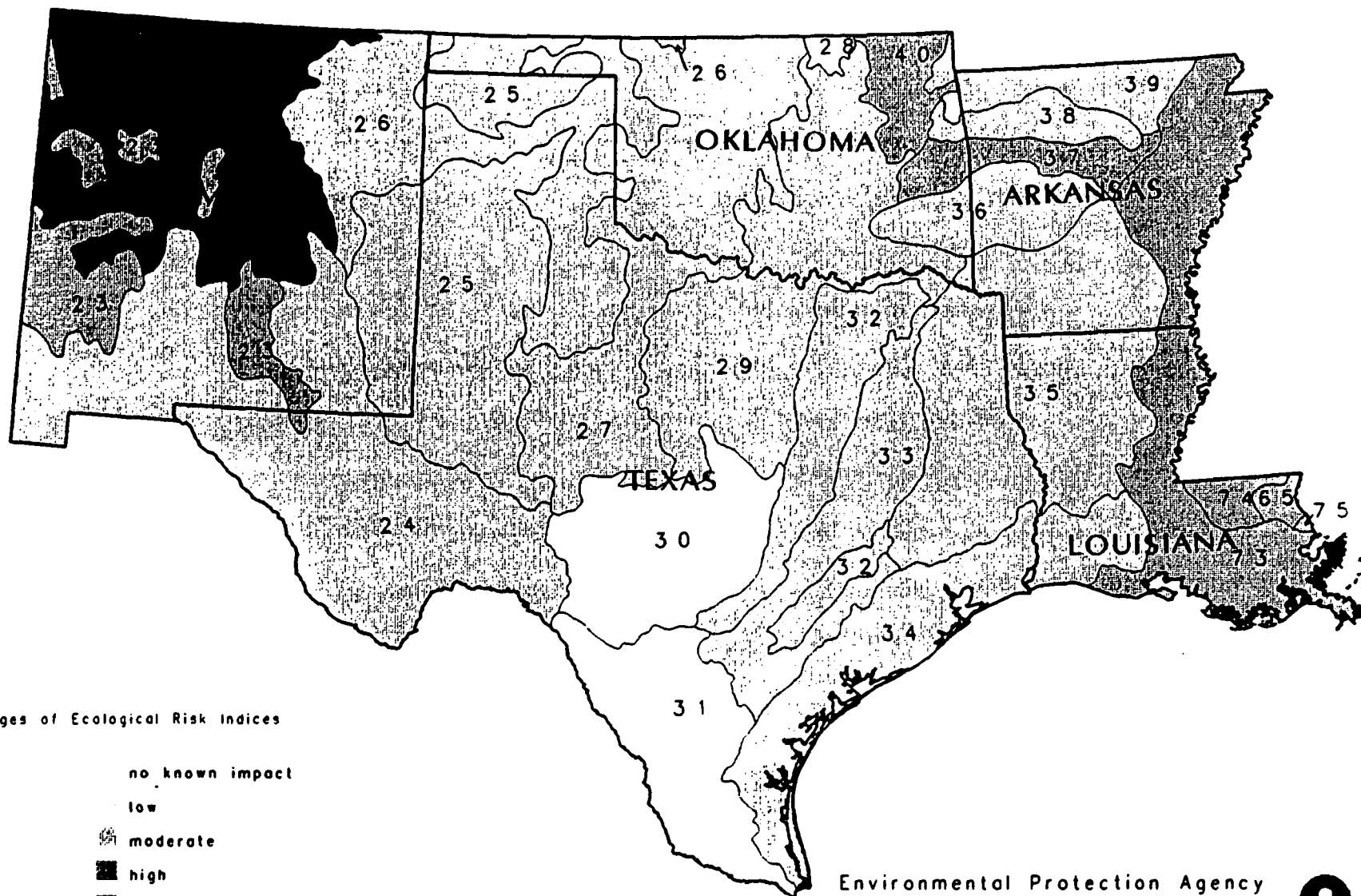
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| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
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| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

Non Point Source Discharges

Distribution of Ecological Risk per Ecoregion



Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



MAP LEGEND

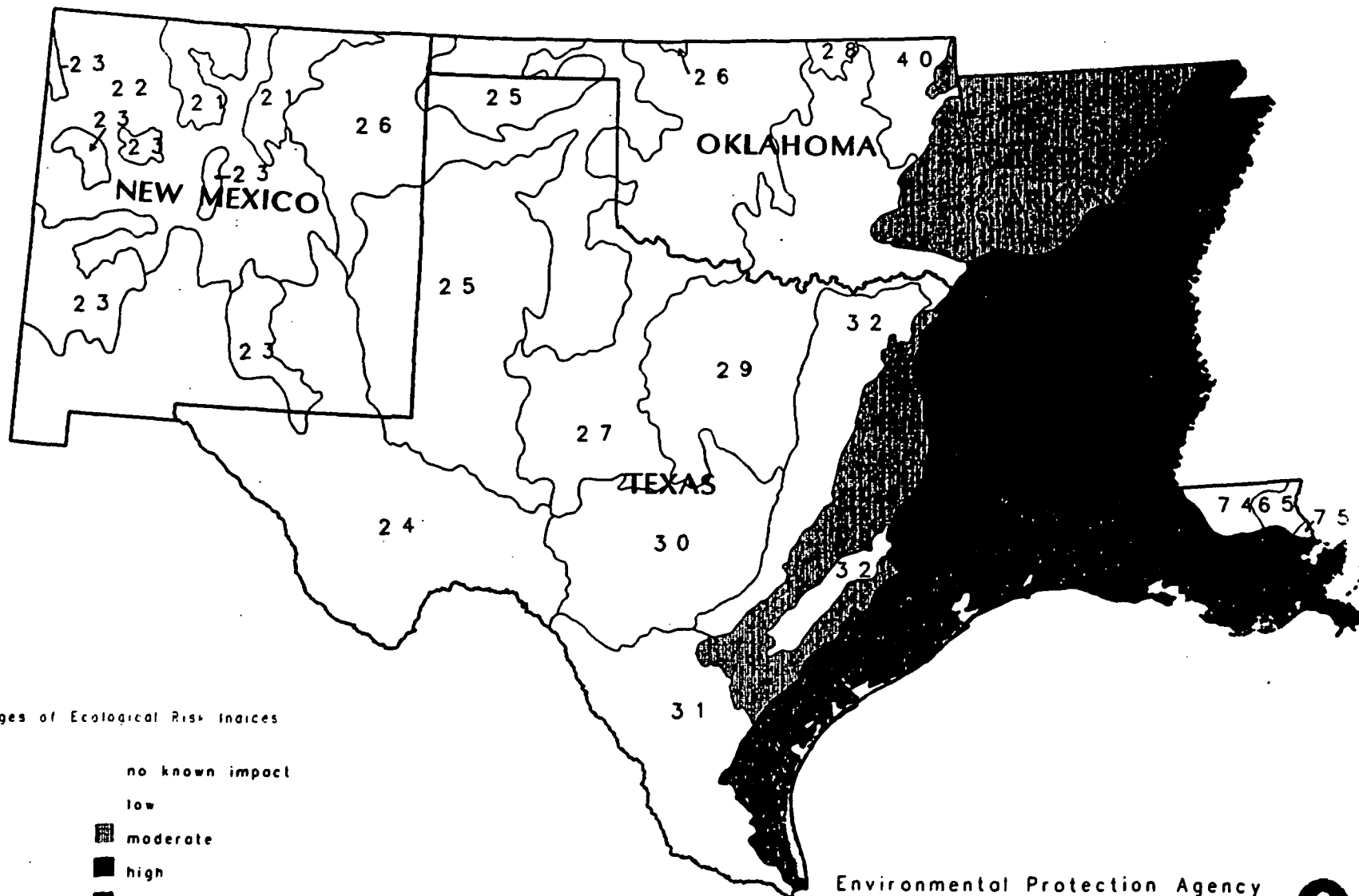
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| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 5

Water and Wetlands

Distribution of Ecological Risk per Ecoregion



Ranges of Ecological Risk Indices

- no known impact
- low
- moderate
- high
- higher

Environmental Protection Agency
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Dallas, TX



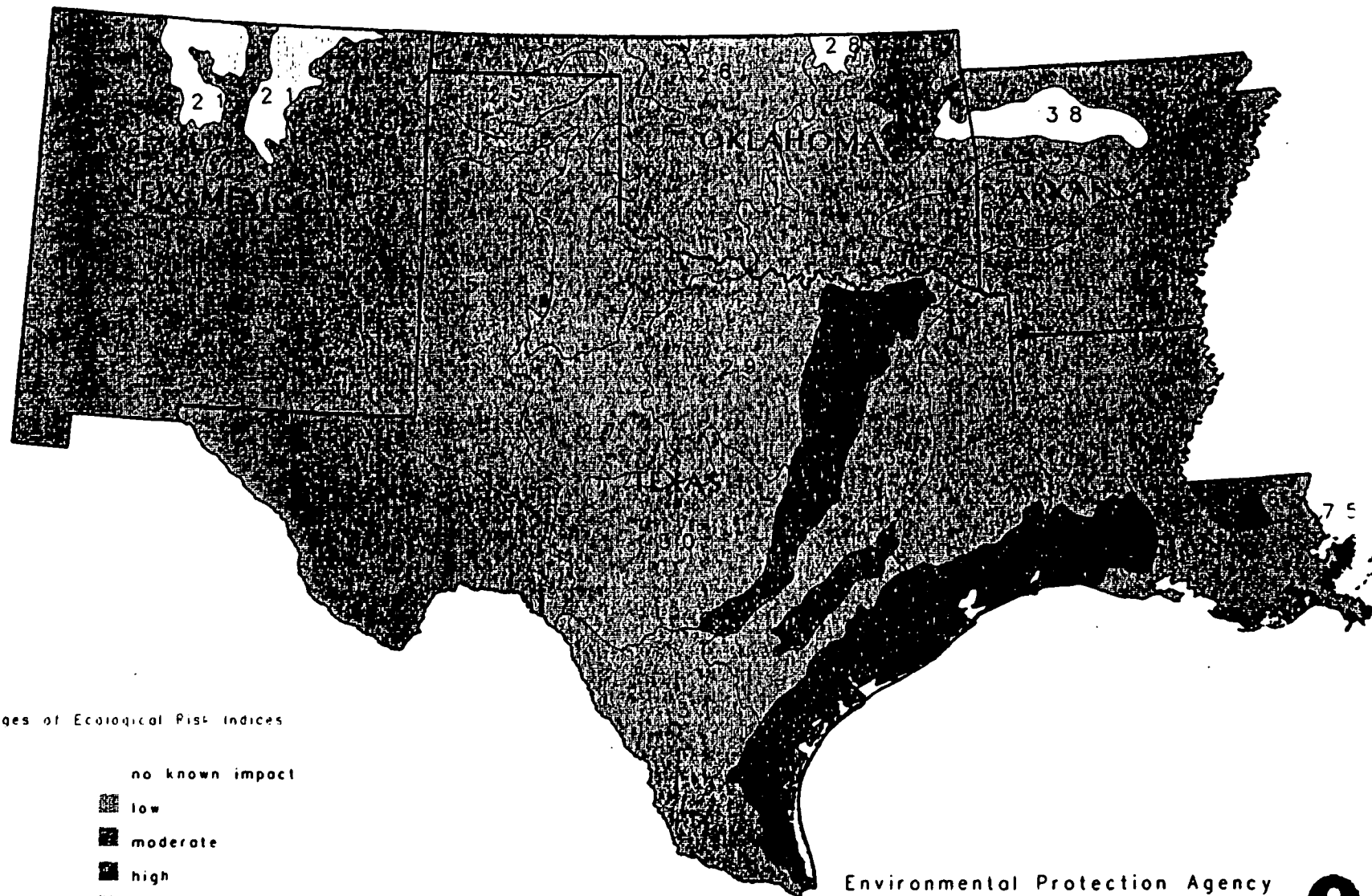
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| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

R.C.R.A Hazardous Waste Sites

Distribution of Ecological Risk per Ecoregion



Ranges of Ecological Risk Indices

- no known impact
- low
- moderate
- high
- higher

Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



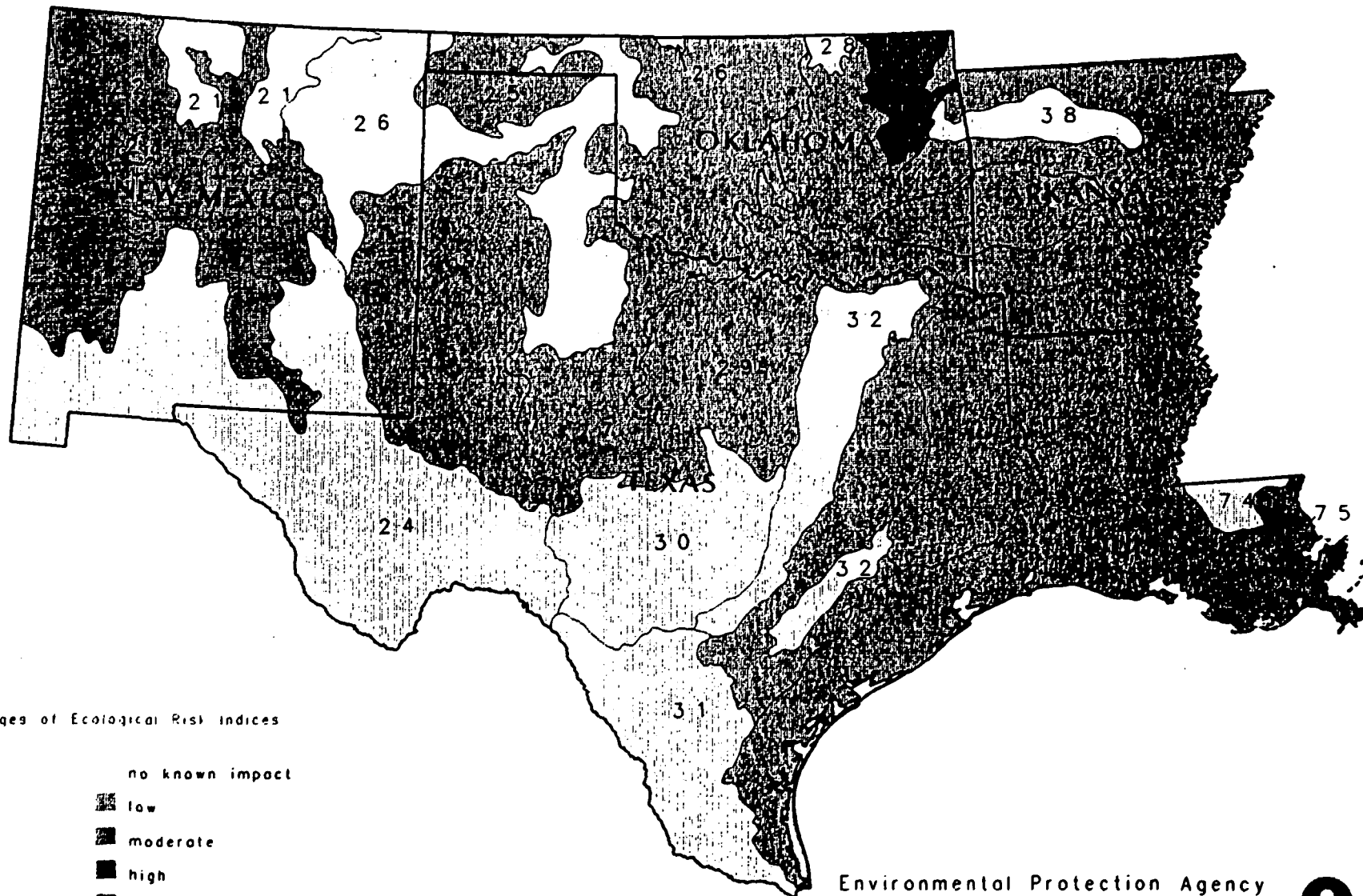
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| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 7

CERCLA Hazardous Waste Sites Distribution of Ecological Risk per Ecoregion



Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



MAP LEGEND

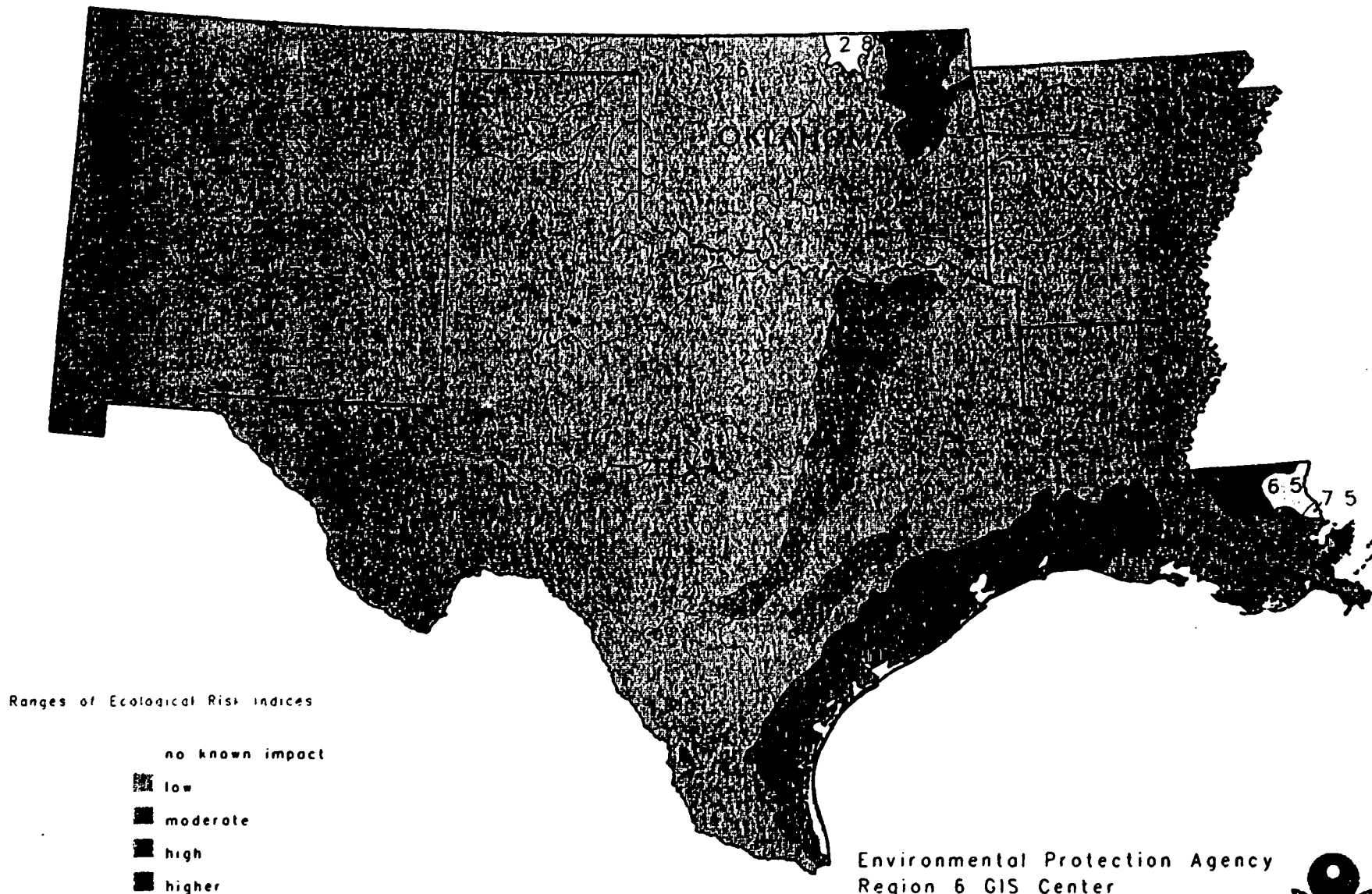
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| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
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| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 8

Accidental Releases

Distribution of Ecological Risk per Ecoregion.



Ranges of Ecological Risk indices

- no known impact
- low
- moderate
- high
- higher

Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



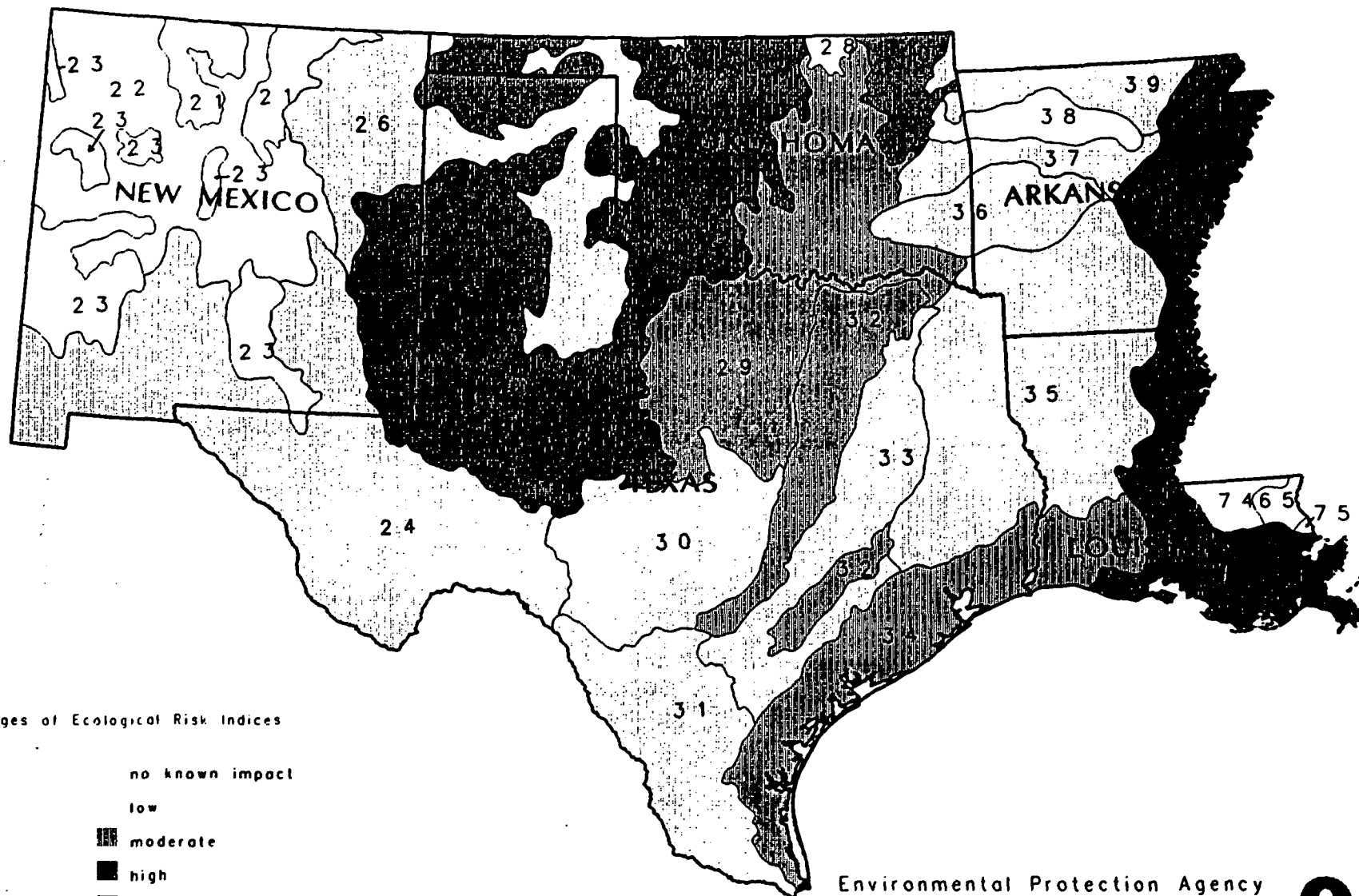
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| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
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| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
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| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

Application of Pesticides

Distribution of Ecological Risk per Ecoregion



Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



Source: State Agricultural Departments

MAP LEGEND

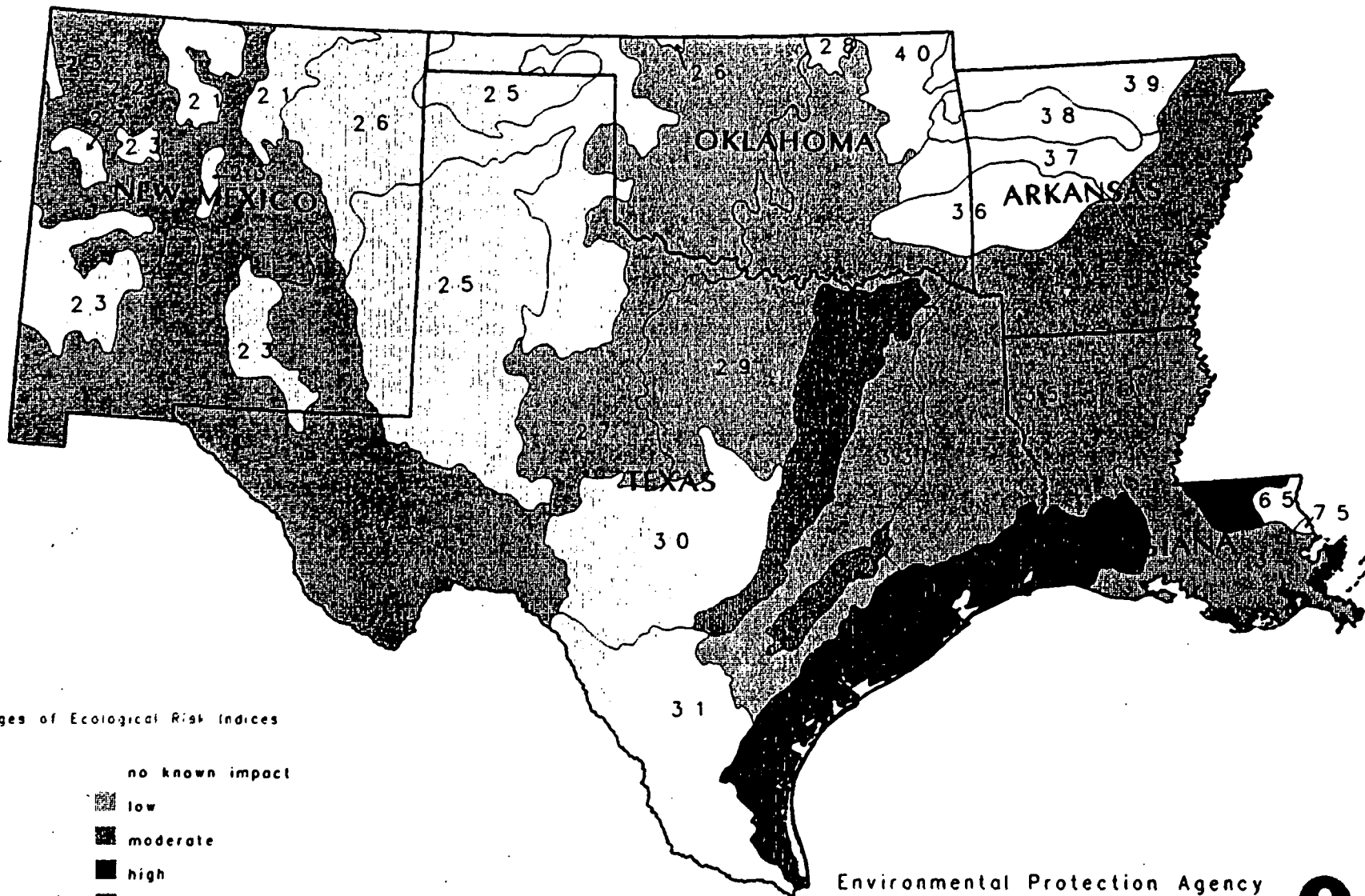
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| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
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| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 10

Ozone and CO

Distribution of Ecological Risk per Ecoregion



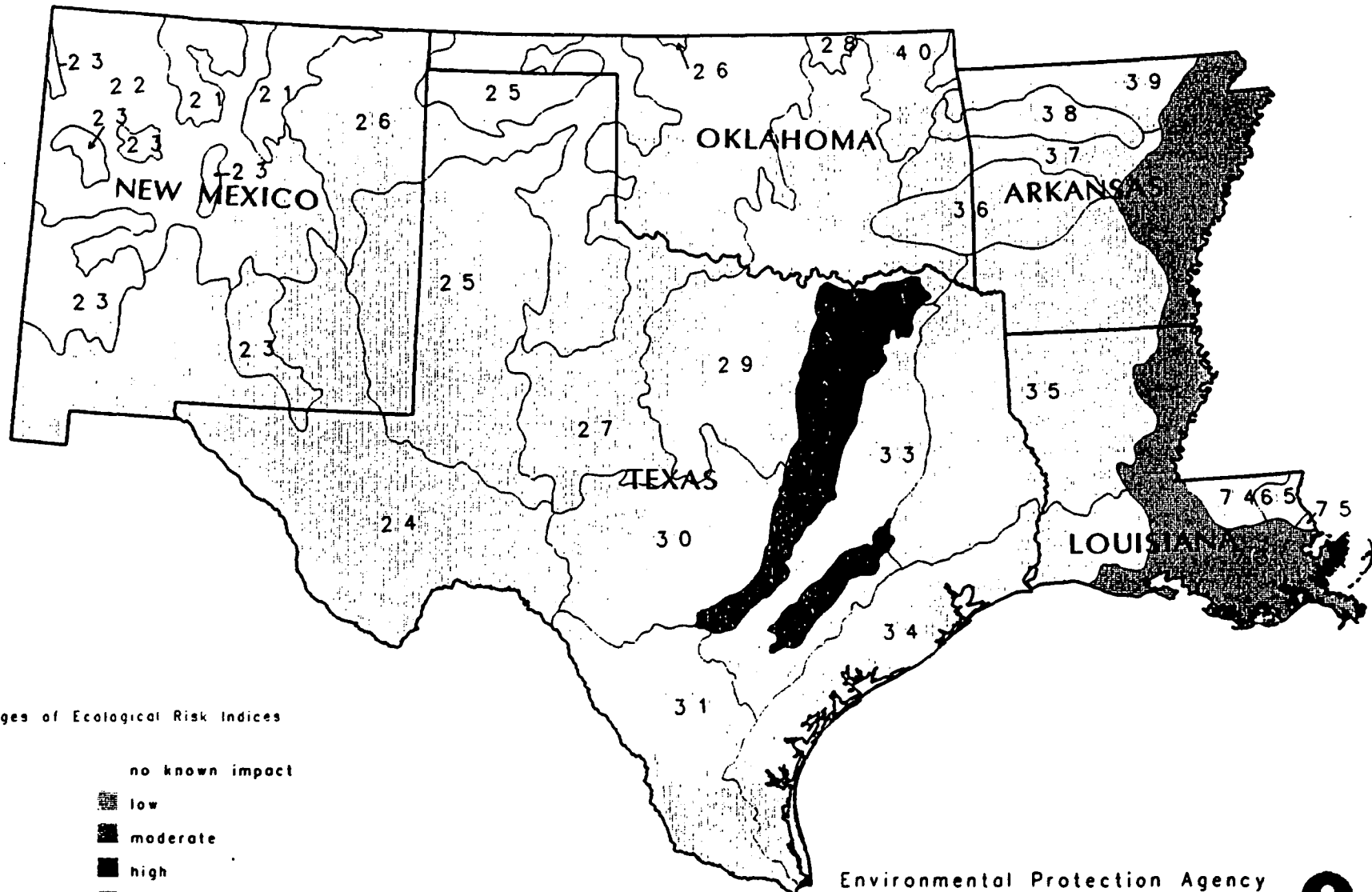
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| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

Airborne Lead

Distribution of Ecological Risk per Ecoregion



Ranges of Ecological Risk Indices

- no known impact
- low
- moderate
- high
- higher

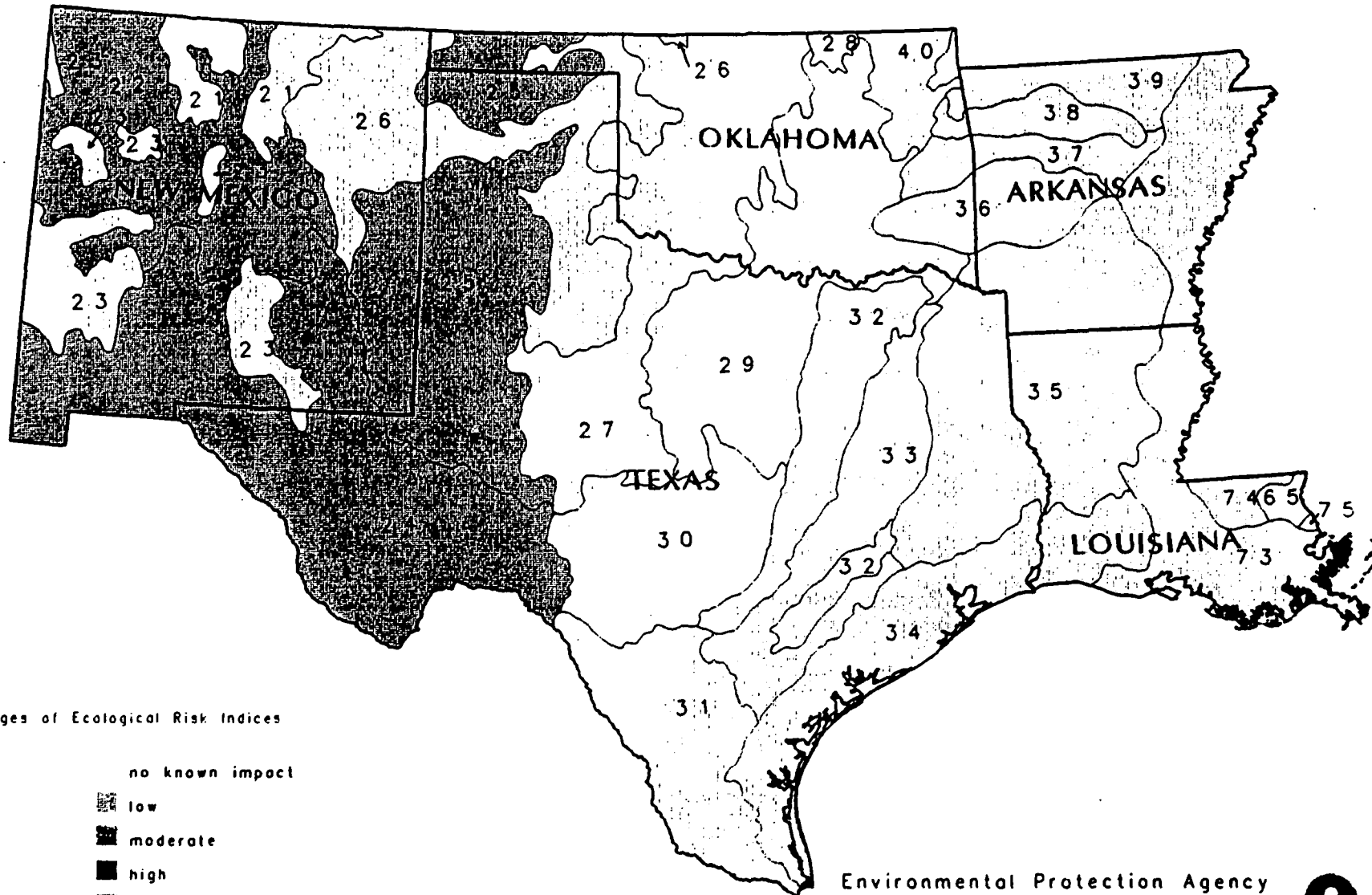


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| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

Particulate Matter Distribution of Ecological Risk per Ecoregion



Ranges of Ecological Risk Indices

- no known impact
- low
- moderate
- high
- higher

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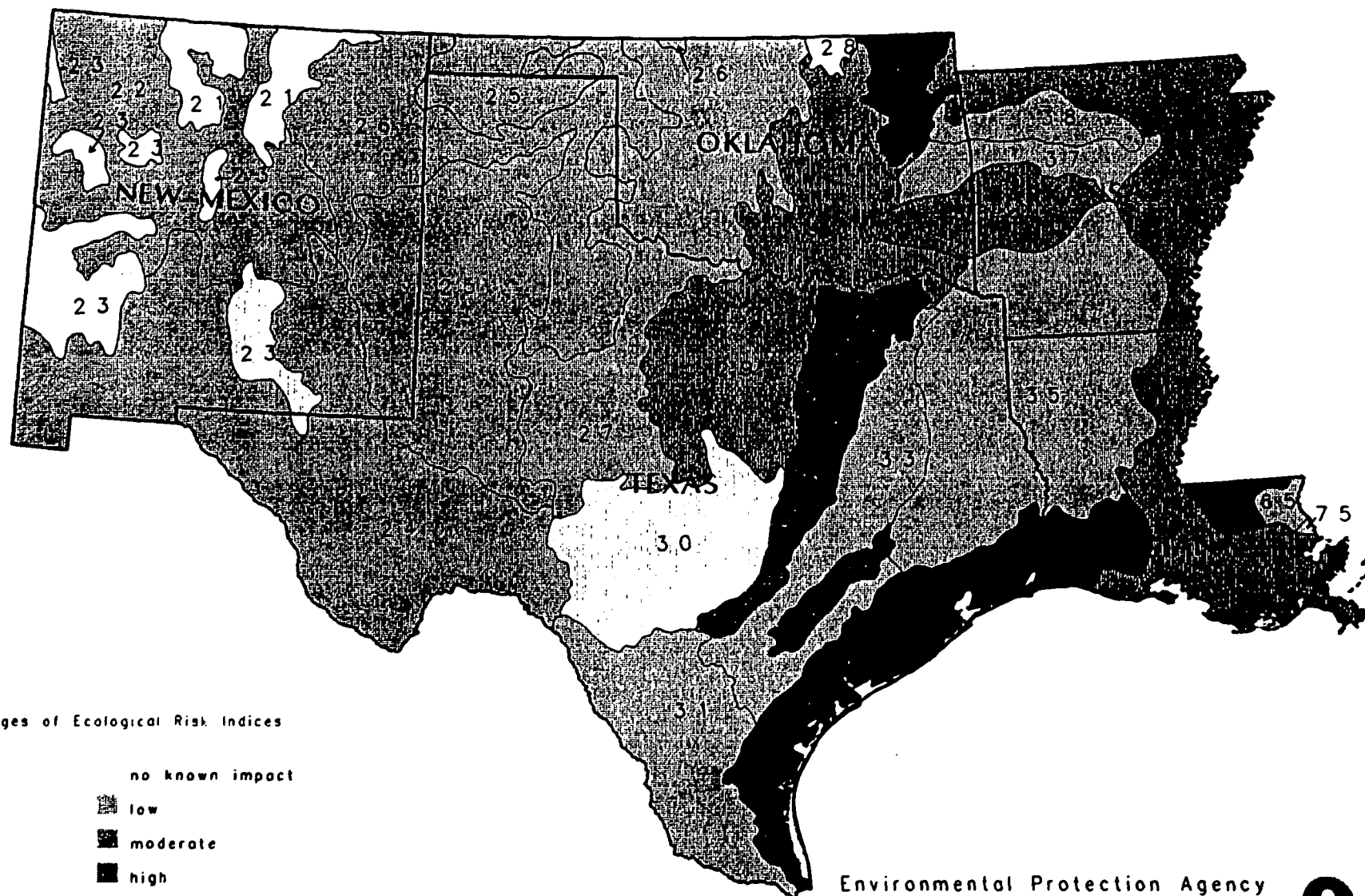


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| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
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| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

Toxic Air Pollutants Distribution of Ecological Risk per Ecoregion



Ranges of Ecological Risk Indices

- no known impact
- low
- moderate
- high
- higher



MAP LEGEND

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|------------------------------------|---|
| 21) Southern Rockies, NM | 33) East Central Texas Plains |
| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.



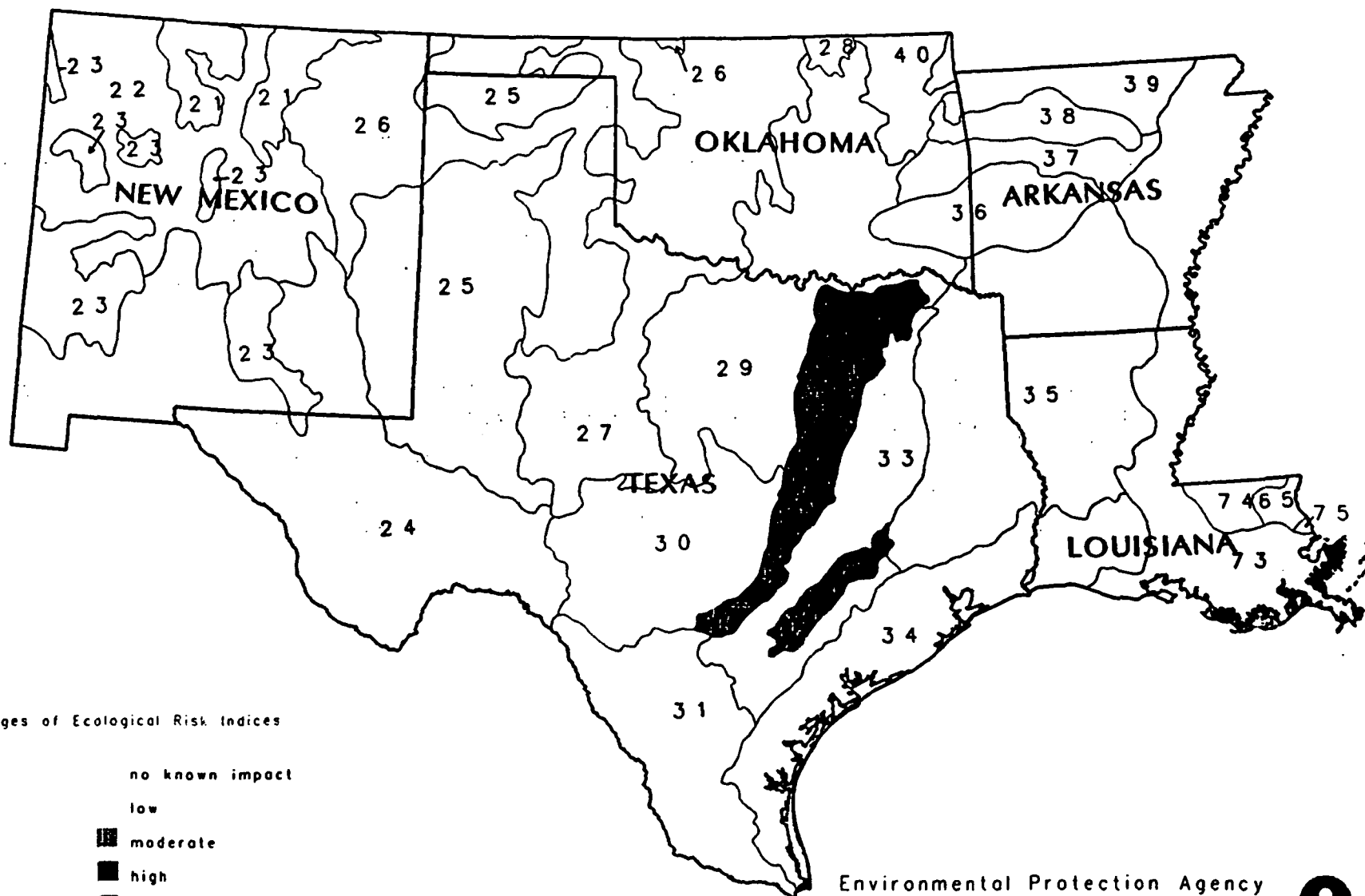
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| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
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| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

Physical Degradation - Urbanization

Distribution of Ecological Risk per Ecoregion



Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



MAP LEGEND

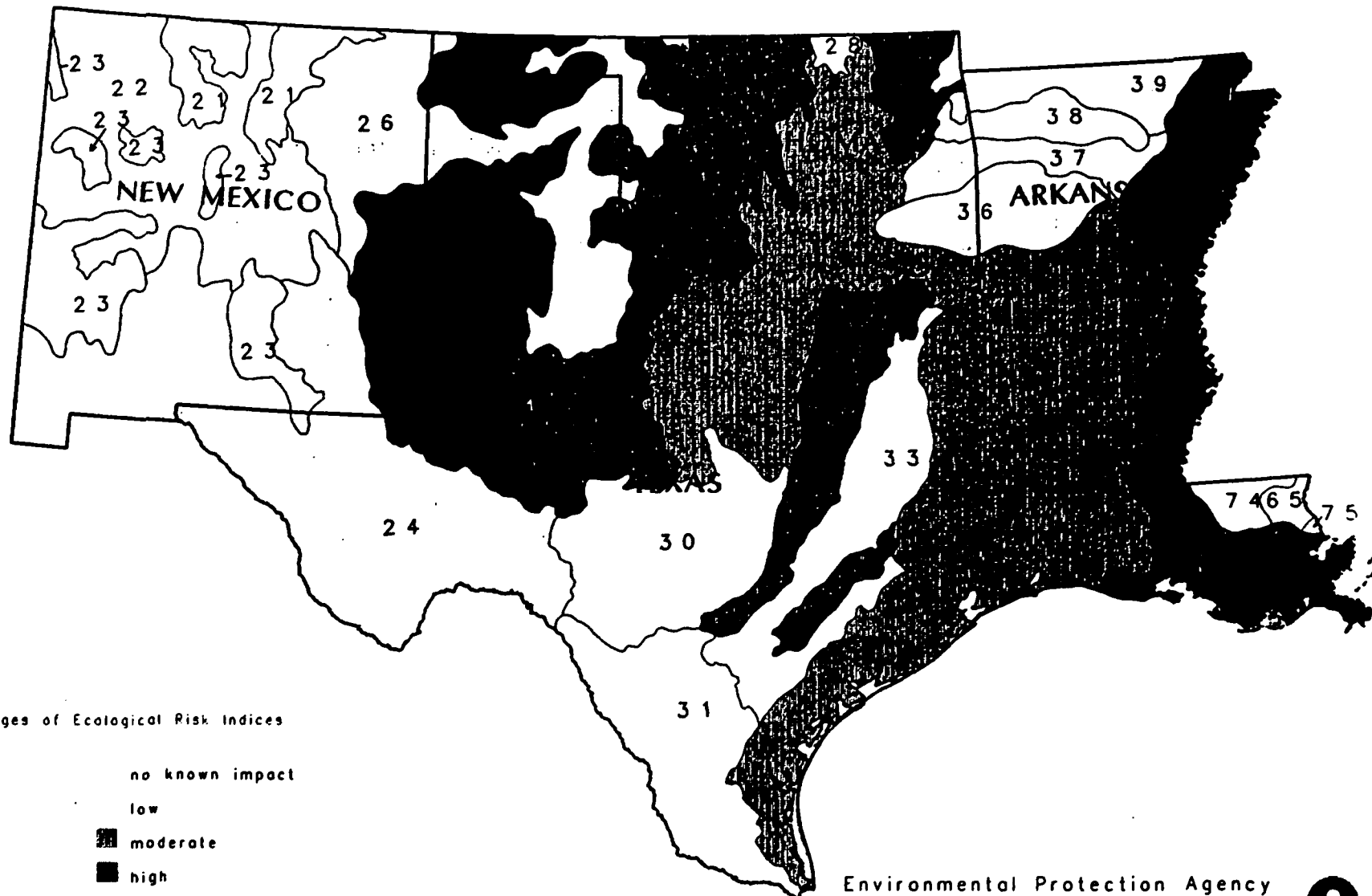
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| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 16

Physical Degradation - Agriculture

Distribution of Ecological Risk per Ecoregion



Environmental Protection Agency
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Dallas, TX



source: U.S. Department of Agriculture

MAP LEGEND

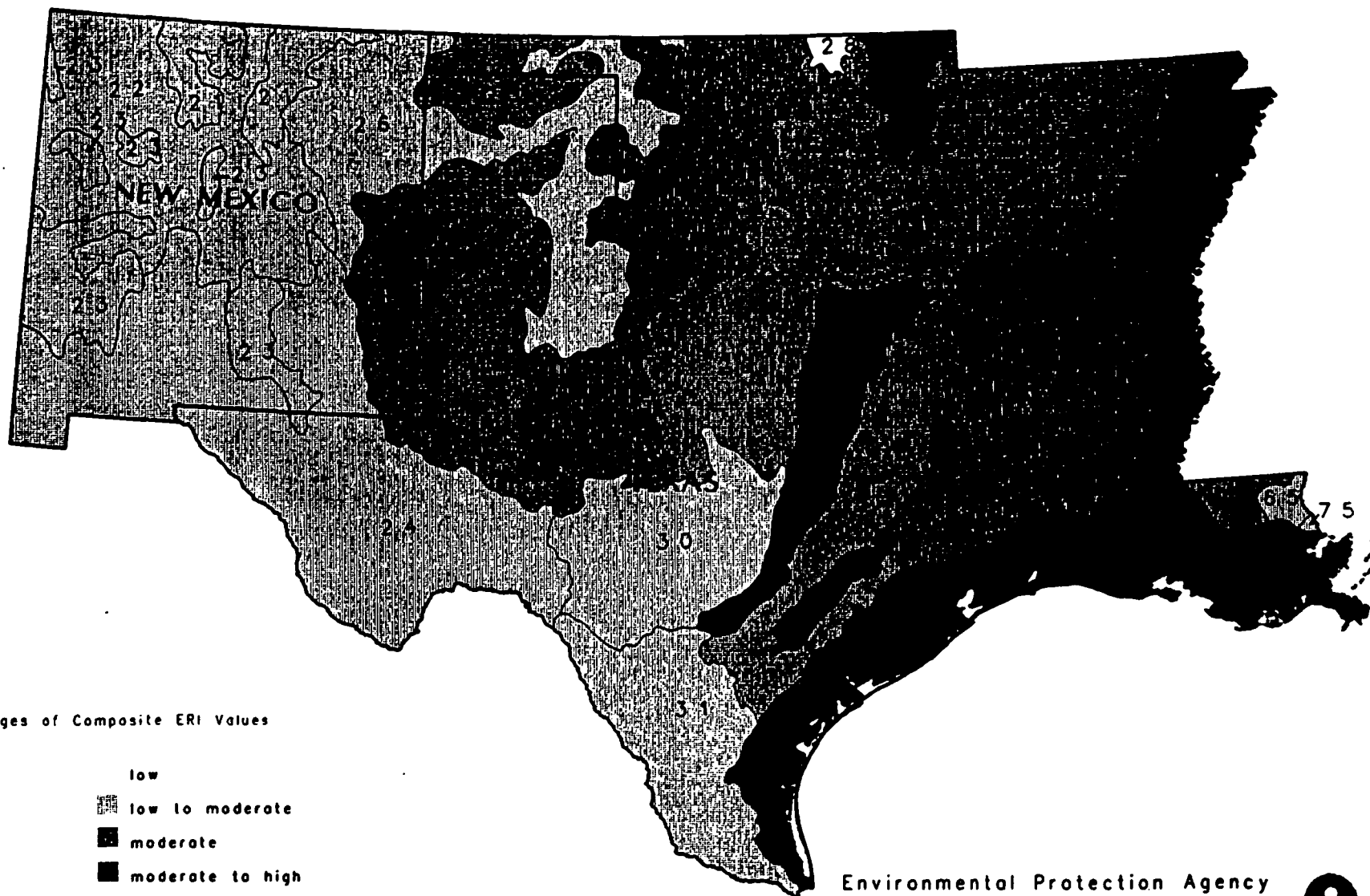
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| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
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| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 17

Ecoregional ERI Rankings

Distribution of Ecoregion's Ecological Risk



Ranges of Composite ERI Values

- low
- low to moderate
- moderate
- moderate to high
- high

Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



TABLE 19

RISK MATRIX - EPA Region 6
for the CENTRAL TEXAS PLATEAU, TX (30) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
5) Physical Degradation of Water & Wetlands		0.15733	0.00000	0.07867	0.15733	0.05244	0.10489	0.11800	0.66867
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.01784	0.01793	0.00598	0.01196	0.01793	0.07164
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.01259	0.01259	0.00420	0.00839	0.00000	0.03776
13) Application of Pesticides		0.10134	0.00000	0.30403	0.20268	0.13512	0.40537	0.10134	1.24989
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat		0.00000	0.00000	0.20268	0.00000	0.00000	0.13512	0.00000	0.33781
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.25868	0.00000	0.61580	0.39054	0.19774	0.66573	0.23728	2.36576

The ecological Risk Index Value for this region is 2.36576
 (This number is determined by adding the RI totals for Ecological Problems)

TABLE 20

RISK MATRIX - EPA Region 6
for the SOUTHERN DESERTS, NM & TX (24) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	HYDROLOGY	O2 PRODUCTION	FILTERING/ DETOXIFYING	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
ECOLOGICAL FUNCTIONS	CONSUMPTION	CO2	POLLUTANTS					
1) Industrial Point Discharge to Surface Waters	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters	0.00000	0.00000	0.43093	0.00000	0.02873	0.11491	0.14364	0.71821
3) Drinking Waters, Public & Private	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges	0.00000	0.00000	0.65726	0.00000	0.04382	0.17527	0.21909	1.09544
5) Physical Degradation of Water & Wetlands	0.15041	0.00000	0.07521	0.03008	0.03008	0.12033	0.11281	0.51893
6) Other Ground-Water Contamination	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites	0.00000	0.00000	0.03103	0.00624	0.00624	0.02496	0.03120	0.09968
9) CERCLA Hazardous Waste Sites	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10) Other Waste - Municipal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases	0.00000	0.00000	0.02188	0.00401	0.00401	0.01750	0.00000	0.04740
13) Application of Pesticides	0.02918	0.00000	0.08755	0.01167	0.02335	0.14008	0.02918	0.32101
14) Sulfur & Nitrogen Oxides (Acid Depostion)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide	0.00000	0.00000	0.14565	0.02913	0.02913	0.11652	0.14565	0.46607
16) Airborne Lead	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter	0.00000	0.00000	0.01841	0.00368	0.00368	0.01473	0.01841	0.05891
18) Hazardous/Toxic Air Pollutants	0.00000	0.00000	0.06199	0.01240	0.01240	0.04959	0.06199	0.19836
19) Indoor Air Pollutants	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat	0.03034	0.00000	0.08112	0.00303	0.00000	0.09431	0.03034	0.23914
23) Oil & Gas	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS	0.20993	0.00000	1.61102	0.10025	0.18144	0.86820	0.79231	3.76314

The ecological Risk Index Value for this region is 3.76314
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 21

RISK MATRIX - EPA Region 6
for the ARIZONA/NEW MEXICO MOUNTAINS, NM & TX (23) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.08135	0.00000	0.02712	0.02712	0.01627	0.15185
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	1.56852	0.00000	0.53544	0.52284	0.31370	2.94050
5) Physical Degradation of Water & Wetlands		0.15075	0.00000	0.09422	0.03769	0.18843	0.18843	0.08479	0.74431
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.00778	0.00156	0.00782	0.00782	0.00469	0.02968
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00173	0.00035	0.00173	0.00173	0.00104	0.00657
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.01370	0.00274	0.01370	0.01370	0.00000	0.04385
13) Application of Pesticides		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degredation of Terrestrial Ecosystems/Habitat		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.15075	0.00000	1.76729	0.04234	0.77424	0.76164	0.42050	3.91676

The ecological Risk Index Value for this region is 3.91676
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 22

RISK MATRIX - EPA Region 6
for the SOUTHERN TEXAS PLAINS, TX (31) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
5) Physical Degradation of Water & Wetlands		0.20962	0.00000	0.12354	0.17216	0.06987	0.06987	0.17595	0.82102
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.01145	0.01152	0.00384	0.00384	0.01152	0.04216
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.03704	0.03704	0.01235	0.01235	0.00000	0.09878
13) Application of Pesticides		0.24837	0.00000	0.74511	0.49674	0.33116	0.49674	0.24837	2.56648
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.04041	0.04041	0.01347	0.01347	0.04041	0.14817
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degredation of Terrestrial Ecosystems/Habitat		0.07489	0.00000	0.55291	0.03745	0.00000	0.19054	0.07489	0.93068
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.53288	0.00000	1.51046	0.79531	0.43069	0.78681	0.55113	4.60728

The ecological Risk Index Value for this region is 4.60728
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 23

RISK MATRIX - EPA Region 6
for the SOUTHWESTERN TABLELANDS, TX & OK (26) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	HYDROLOGY	O ₂ PRODUCTION CO ₂ CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
ECOLOGICAL FUNCTIONS								
1) Industrial Point Discharge to Surface Waters	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters	0.00000	0.00000	0.09993	0.00000	0.01110	0.01110	0.04441	0.16655
3) Drinking Waters, Public & Private	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges	0.00000	0.00000	0.58355	0.00000	0.07553	0.06484	0.25935	0.98327
5) Physical Degradation of Water & Wetlands	0.15394	0.00000	0.07697	0.10263	0.05131	0.05131	0.15394	0.59012
6) Other Ground-Water Contamination	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites	0.00000	0.00000	0.00225	0.00151	0.00076	0.00076	0.00302	0.00830
9) CERCLA Hazardous Waste Sites	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10) Other Waste - Municipal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases	0.00000	0.00000	0.02682	0.01589	0.00795	0.00894	0.00000	0.05959
13) Application of Pesticides	0.23021	0.00000	0.69064	0.30695	0.30695	0.46043	0.30695	2.30214
14) Sulfur & Nitrogen Oxides (Acid Deposition)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants	0.00000	0.00000	0.03178	0.02119	0.01059	0.01059	0.04238	0.11653
19) Indoor Air Pollutants	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degredation of Terrestrial Ecosystems/Habitat	0.00000	0.00000	0.46043	0.00000	0.00000	0.15348	0.00000	0.61390
23) Oil & Gas	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS	0.38416	0.00000	1.97237	0.44817	0.46420	0.76145	0.81006	4.84041

The ecological Risk Index Value for this region is 4.84041
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 24

RISK MATRIX - EPA Region 6
for the SOUTHERN ROCKIES, NM (21) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.08440	0.00000	0.00563	0.02251	0.01688	0.12942
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	4.08534	0.00000	0.34207	1.08942	0.81707	6.33390
5) Physical Degradation of Water & Wetlands		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.00000	0.00000	0.00000	0.01021	0.00000	0.01021
13) Application of Pesticides		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degredation of Terrestrial Ecosystems/Habitat		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	4.16974	0.00000	0.34770	1.12214	0.83395	6.47353

The ecological Risk Index Value for this region is 6.47353
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 25

RISK MATRIX - EPA Region 6
for the SOUTHEASTERN PLAINS, LA (65 & 75) (65) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
ECOLOGICAL FUNCTIONS								
1) Industrial Point Discharge to Surface Waters	0.00000	0.00000	1.00544	0.00000	0.23072	0.16757	0.16757	1.57130
2) POTW Discharges to Surface Waters	0.00000	0.00000	1.47173	0.00000	0.30843	0.47843	0.32300	2.58160
3) Drinking Waters, Public & Private	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges	0.00000	0.00000	1.54459	0.00000	0.32057	0.52701	0.34729	2.73946
5) Physical Degradation of Water & Wetlands	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
6) Other Ground-Water Contamination	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites	0.00000	0.00000	0.03703	0.09308	0.01862	0.07446	0.03723	0.26041
9) CERCLA Hazardous Waste Sites	0.00000	0.00000	0.00441	0.01103	0.00221	0.00883	0.00441	0.03090
10) Other Waste - Municipal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
13) Application of Pesticides	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
14) Sulfur & Nitrogen Oxides (Acid Deposition)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants	0.00000	0.00000	0.13047	0.32618	0.06524	0.19571	0.13047	0.84806
19) Indoor Air Pollutants	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23) Oil & Gas	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS	0.00000	0.00000	4.19367	0.43029	0.94578	1.45201	1.00998	8.03172

The ecological Risk Index Value for this region is 8.03172
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 26

RISK MATRIX - EPA Region 6
for the ARIZONA/NEW MEXICO PLATEAU, NM (22) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.33427	0.00000	0.11421	0.08914	0.11142	0.64904
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	3.49272	0.00000	0.55188	0.93139	1.16424	6.14024
5) Physical Degradation of Water & Wetlands		0.13346	0.00000	0.08341	0.03336	0.06673	0.13346	0.12512	0.57554
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.03788	0.00762	0.01523	0.03047	0.03808	0.12928
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00366	0.00073	0.00147	0.00293	0.00366	0.01246
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.03170	0.00534	0.00934	0.02536	0.00000	0.07173
13) Application of Pesticides		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.15503	0.03101	0.06201	0.12403	0.15503	0.52712
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.01698	0.00340	0.00679	0.01358	0.01698	0.05772
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.12679	0.02536	0.05071	0.10143	0.12679	0.43107
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat		0.16656	0.00000	0.15615	0.02082	0.00000	0.16656	0.20820	0.71828
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.30002	0.00000	4.43858	0.12763	0.87838	1.61834	1.94952	9.31247

The ecological Risk Index Value for this region is 9.31247
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 27

RISK MATRIX - EPA Region 6
for the EAST CENTRAL TEXAS PLAINS, TX (33) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	HYDROLOGY	O2 PRODUCTION	FILTERING/	SOIL	FISHERIES	WILDLIFE	PRIMARY	ECOLOGICAL
ECOLOGICAL FUNCTIONS	CO2 CONSUMPTION	CO2 CONSUMPTION	DETOXIFYING POLLUTANTS	PRODUCTION	PRODUCTION	PRODUCTION	PRODUCTION	PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters	0.00000	0.00000	0.17245	0.00000	0.02874	0.05748	0.08622	0.34489
2) POTW Discharges to Surface Waters	0.00000	0.00000	0.58764	0.00000	0.09794	0.19588	0.29382	1.17529
3) Drinking Waters, Public & Private	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges	0.00000	0.00000	0.30908	0.00000	0.08910	0.10303	0.15454	0.65574
5) Physical Degradation of Water & Wetlands	0.50891	0.00000	0.25446	1.01783	0.25446	0.50891	0.57253	3.11710
6) Other Ground-Water Contamination	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites	0.00000	0.00000	0.02517	0.05061	0.01265	0.02530	0.03796	0.15169
9) CERCLA Hazardous Waste Sites	0.00000	0.00000	0.00033	0.00067	0.00017	0.00033	0.00050	0.00201
10) Other Waste - Municipal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases	0.00000	0.00000	0.03571	0.07142	0.01786	0.03571	0.00000	0.16070
13) Application of Pesticides	0.17009	0.00000	0.51026	0.68035	0.34017	1.02052	0.25513	2.97653
14) Sulfur & Nitrogen Oxides (Acid Deposition)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide	0.00000	0.00000	0.05066	0.10132	0.02533	0.05066	0.07599	0.30395
16) Airborne Lead	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants	0.00000	0.00000	0.07388	0.14777	0.03694	0.07388	0.11083	0.44330
19) Indoor Air Pollutants	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat	0.05004	0.00000	0.37771	0.05004	0.00000	0.39022	0.07507	0.94308
23) Oil & Gas	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS	0.72904	0.00000	2.39734	2.12000	0.90336	2.46194	1.66258	10.27426

The ecological Risk Index Value for this region is 10.27426
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 28

RISK MATRIX - EPA Region 6
for the CENTRAL OLKAHOMA/TEXAS PLAINS, TX & OK (29) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.01855	0.00000	0.00309	0.00927	0.01236	0.04328
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.06934	0.00000	0.01156	0.03467	0.04622	0.16178
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	0.02277	0.00000	0.00379	0.01138	0.01518	0.05313
5) Physical Degradation of Water & Wetlands		0.16382	0.00000	0.08191	0.24573	0.08191	0.24573	0.24573	1.06485
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.03205	0.04834	0.01611	0.04834	0.06445	0.20929
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00065	0.00097	0.00032	0.00097	0.00130	0.00422
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.03784	0.05253	0.01694	0.05676	0.00000	0.16408
13) Application of Pesticides		0.21153	0.00000	0.63459	0.63459	0.42306	1.90378	0.42306	4.23062
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.15802	0.23703	0.07901	0.23703	0.31604	1.02712
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.33211	0.49816	0.16605	0.49816	0.66421	2.15869
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat		0.02856	0.00000	0.44448	0.02142	0.00000	0.67743	0.05711	1.22899
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.40391	0.00000	1.83230	1.73877	0.80186	3.72353	1.84568	10.34605

The ecological Risk Index Value for this region is 10.34605
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 29

RISK MATRIX - EPA Region 6
for the OZARK HIGHLANDS, AR & OK (39) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	HYDROLOGY	O2 PRODUCTION	FILTERING/	SOIL	FISHERIES	WILDLIFE	PRIMARY	ECOLOGICAL
ECOLOGICAL FUNCTIONS	CO2 CONSUMPTION	DETOXIFYING POLLUTANTS	PRODUCTION	PRODUCTION	PRODUCTION	PRODUCTION	PRODUCTION	PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters	0.00000	0.00000	0.05166	0.00000	0.01722	0.01148	0.01148	0.09184
3) Drinking Waters, Public & Private	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges	0.00000	0.00000	0.00916	0.00000	0.00102	0.00204	0.00204	0.01425
5) Physical Degradation of Water & Wetlands	0.29687	0.00000	0.44530	0.89060	0.29687	0.59373	0.44530	2.96867
6) Other Ground-Water Contamination	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites	0.00000	0.00000	0.03940	0.03962	0.01321	0.02641	0.02641	0.14505
9) CERCLA Hazardous Waste Sites	0.00000	0.00000	0.00010	0.00226	0.00075	0.00226	0.00151	0.00688
10) Other Waste - Municipal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases	0.00000	0.00000	0.03476	0.03476	0.01593	0.02317	0.00000	0.10861
13) Application of Pesticides	0.04460	0.00000	0.40142	0.26761	0.17841	0.53523	0.08920	1.51648
14) Sulfur & Nitrogen Oxides (Acid Deposition)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants	0.00000	0.00000	0.59084	0.59084	0.19695	0.39389	0.39389	2.16641
19) Indoor Air Pollutants	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degredation of Terrestrial Ecosystems/Habitat	0.01112	0.00000	1.69381	1.36768	0.00000	1.17934	0.02224	4.27418
23) Oil & Gas	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS	0.35259	0.00000	3.26645	3.19336	0.72035	2.76755	0.99207	11.29238

The ecological Risk Index Value for this region is 11.29238
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 30

RISK MATRIX - EPA Region 6
for the WESTERN HIGH PLAINS, NM & TX (25) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	0.19095	0.00000	0.06365	0.02122	0.08487	0.36069
5) Physical Degradation of Water & Wetlands		0.26378	0.00000	0.11755	0.08356	0.06007	0.06007	0.21681	0.80185
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.04040	0.02708	0.01354	0.01354	0.05417	0.14874
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00038	0.00025	0.00013	0.00013	0.00051	0.00139
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.04821	0.02373	0.01187	0.01607	0.00000	0.09988
13) Application of Pesticides		1.28233	0.00000	2.30819	1.02586	1.02586	1.53879	1.02586	8.20689
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00631	0.00420	0.00000	0.00210	0.00841	0.02102
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.07713	0.05142	0.02571	0.02571	0.10284	0.28282
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat		0.16613	0.00000	1.61355	0.03323	0.00000	0.54616	0.13290	2.49197
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		1.71224	0.00000	4.40267	1.24934	1.20083	2.22379	1.62636	12.41523

The ecological Risk Index Value for this region is 12.41523
 (This number is determined by adding the RI totals for Ecological Problems)

TABLE 31

RISK MATRIX - EPA Region 6
for the BOSTON MOUNTAINS, AR & OK (38) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	0.15700	0.00000	0.01744	0.05233	0.03489	0.26167
5) Physical Degradation of Water & Wetlands		0.43645	0.00000	0.65467	1.30934	0.43645	1.30934	0.65467	4.80091
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.01309	0.00000	0.00436	0.00873	0.00000	0.02619
13) Application of Pesticides		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.47136	0.47136	0.15712	0.47136	0.31424	1.88545
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degredation of Terrestrial Ecosystems/Habitat		0.00000	0.00000	2.03585	2.03585	0.00000	2.08626	0.00000	6.15796
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.43645	0.00000	3.33198	3.81655	0.61538	3.92802	1.00380	13.13217

The ecological Risk Index Value for this region is 13.13217
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 32

RISK MATRIX - EPA Region 6
for the ARKANSAS VALLEY, AR & OK (37) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.02332	0.00000	0.01166	0.00777	0.00389	0.04663
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.06703	0.00000	0.03352	0.02234	0.01117	0.13407
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	1.06788	0.00000	0.18381	0.35596	0.17798	1.78562
5) Physical Degradation of Water & Wetlands		0.36543	0.00000	0.36543	1.09630	0.36543	0.73087	0.27408	3.19755
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.01578	0.02380	0.00793	0.01587	0.00793	0.07132
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00088	0.00133	0.00044	0.00088	0.00044	0.00398
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.02436	0.01566	0.01218	0.02088	0.00000	0.07309
13) Application of Pesticides		0.06828	0.00000	0.40968	0.40968	0.27312	0.81936	0.06828	2.04839
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.37588	0.49856	0.18794	0.37588	0.18794	1.62618
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat		0.05123	0.00000	1.42365	1.65148	0.00000	1.47319	0.05123	4.65077
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.48494	0.00000	3.77389	3.69681	1.07603	3.82300	0.78294	13.63761

The ecological Risk Index Value for this region is 13.63761
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 33

RISK MATRIX - EPA Region 6
for the OUACHITA MOUNTAINS, AR & OK (36) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	0.54791	0.00000	0.06088	0.18264	0.12176	0.91319
5) Physical Degradation of Water & Wetlands		0.55538	0.00000	0.41653	1.11075	0.27769	0.83306	0.41653	3.60994
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.03855	0.05168	0.01292	0.03876	0.02584	0.16774
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00372	0.00496	0.00124	0.00372	0.00248	0.01613
0) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
1) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) Accidental Releases		0.00000	0.00000	0.04080	0.05440	0.01813	0.05440	0.00000	0.16775
3) Application of Pesticides		0.07585	0.00000	0.34134	0.30342	0.15171	0.68269	0.07585	1.63086
4) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
5) Ozone & Carbon Monoxide		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
6) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.88407	1.17876	0.29469	0.88407	0.58938	3.83096
9) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
1) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) Physical Degradation of Terrestrial Ecosystems/Habitat		0.13275	0.00000	2.59794	2.66049	0.00000	2.97295	0.13275	8.49686
3) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.76398	0.00000	4.87086	5.36445	0.81726	5.65229	1.36459	18.83342

The ecological Risk Index Value for this region is 18.83342
 (This number is determined by adding the RI totals for Ecological Problems)

TABLE 34

RISK MATRIX - EPA Region 6
for the MISSISSIPPI VALLEY LOESS PLAIN (74) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.28502	0.00000	0.07465	0.04750	0.09501	0.50218
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.36646	0.00000	0.06108	0.06108	0.12215	0.61076
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	1.23782	0.00000	0.23345	0.20630	0.41261	2.09017
5) Physical Degradation of Water & Wetlands		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.13594	0.34171	0.06834	0.06834	0.13668	0.75102
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.63808	1.59520	0.31904	0.31904	0.00000	2.87136
13) Application of Pesticides		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.91297	2.28243	0.45649	0.91297	1.82594	6.39079
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	1.07676	2.69190	0.53838	0.53838	1.07676	5.92217
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degredation of Terrestrial Ecosystems/Habitat		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.00000	0.00000	4.65304	6.91123	1.75142	2.15361	3.66915	19.13846

The ecological Risk Index Value for this region is 19.13846
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 35

RISK MATRIX - EPA Region 6
for the CENTRAL GREAT PLAINS, TX & OK (27) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.03515	0.00000	0.00901	0.01757	0.02343	0.08517
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.05433	0.00000	0.01032	0.02717	0.03622	0.12804
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	0.49082	0.00000	0.08389	0.24541	0.32721	1.14732
5) Physical Degradation of Water & Wetlands		0.16659	0.00000	0.05553	0.16659	0.05553	0.16659	0.16659	0.77741
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.01721	0.02596	0.00865	0.02596	0.03462	0.11241
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00306	0.00459	0.00153	0.00459	0.00612	0.01990
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.01463	0.00488	0.00433	0.02519	0.00000	0.04903
13) Application of Pesticides		0.94515	0.00000	1.89030	1.89030	1.26020	5.67089	1.26020	12.91702
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.03037	0.04556	0.01519	0.04556	0.06075	0.19742
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.06934	0.10402	0.03467	0.10402	0.13869	0.45074
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat		0.08191	0.00000	1.30115	0.04096	0.00000	1.97221	0.10922	3.50545
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		1.19365	0.00000	3.96189	2.28284	1.48332	8.30515	2.16304	19.38989

The ecological Risk Index Value for this region is 19.38989
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 36

RISK MATRIX - EPA Region 6
for the SOUTH CENTRAL PLAINS, TX, LA & AR (35) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
ECOLOGICAL FUNCTIONS								
1) Industrial Point Discharge to Surface Waters	0.00000	0.00000	0.20367	0.00000	0.04505	0.04526	0.04526	0.33924
2) POTW Discharges to Surface Waters	0.00000	0.00000	0.52271	0.00000	0.07165	0.11616	0.11616	0.82667
3) Drinking Waters, Public & Private	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges	0.00000	0.00000	0.18890	0.00000	0.02099	0.04198	0.04198	0.29385
5) Physical Degradation of Water & Wetlands	1.01712	0.00000	0.76284	2.03424	0.50856	1.01712	0.76284	6.10272
6) Other Ground-Water Contamination	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites	0.00000	0.00000	0.08340	0.11182	0.02795	0.05591	0.05591	0.33499
9) CERCLA Hazardous Waste Sites	0.00000	0.00000	0.00418	0.00558	0.00139	0.00279	0.00279	0.01674
10) Other Waste - Municipal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases	0.00000	0.00000	0.06980	0.09110	0.02718	0.05437	0.00000	0.24246
13) Application of Pesticides	0.08528	0.00000	0.38376	0.34112	0.17056	0.51167	0.08528	1.57766
14) Sulfur & Nitrogen Oxides (Acid Deposition)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide	0.00000	0.00000	0.06484	0.08646	0.02161	0.04323	0.04323	0.25938
16) Airborne Lead	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants	0.00000	0.00000	0.42613	0.56818	0.14204	0.28409	0.28409	1.70454
19) Indoor Air Pollutants	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat	0.06630	0.00000	4.48475	4.98550	0.00000	3.31637	0.22182	13.07473
23) Oil & Gas	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS	1.16870	0.00000	7.19499	8.22400	1.03701	5.48894	1.65935	24.77299

The ecological Risk Index Value for this region is 24.77299
 (This number is determined by adding the RI totals for Ecological Problems)

TABLE 37

RISK MATRIX - EPA Region 6
for the CENTRAL IRREGULAR PLAINS, OK (40) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.29657	0.00000	0.03295	0.16476	0.09886	0.59313
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.26367	0.00000	0.02930	0.14649	0.08789	0.52735
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	0.96504	0.00000	0.14531	0.53613	0.32168	1.96815
5) Physical Degredation of Water & Wetlands		0.08140	0.00000	0.12210	0.24419	0.08140	0.40698	0.18314	1.11921
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.12357	0.12425	0.04142	0.20708	0.12425	0.62057
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.05160	0.05160	0.01720	0.08599	0.05160	0.25798
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.41117	0.40512	0.13504	0.68528	0.00000	1.63660
13) Application of Pesticides		0.19329	0.00000	1.73960	1.15973	0.77315	5.79866	0.57987	10.24430
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
16) Airborne Lead		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	1.71723	1.71723	0.57241	2.86204	1.71723	8.58613
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degredation of Terrestrial Ecosystems/Habitat		0.09675	0.00000	1.37741	0.14512	0.00000	2.41661	0.29024	4.32612
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		0.37143	0.00000	7.06794	3.84723	1.82817	13.31003	3.45474	29.87955

The ecological Risk Index Value for this region is 29.87955
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 38

RISK MATRIX - EPA Region 6
for the TEXAS BLACKLAND PRAIRIES, TX (32) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
2) POTW Discharges to Surface Waters		0.00000	0.00000	1.09976	0.00000	0.11359	0.14663	0.29327	1.65325
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	0.50885	0.00000	0.06785	0.06785	0.13569	0.78023
5) Physical Degradation of Water & Wetlands		0.17764	0.00000	0.08882	0.35529	0.08882	0.17764	0.26647	1.15469
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.27815	0.22375	0.05594	0.11187	0.22375	0.89345
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.35784	0.30691	0.07673	0.15345	0.00000	0.89493
13) Application of Pesticides		0.39072	0.00000	1.75825	1.56289	0.78145	2.34434	0.78145	7.61910
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.37947	0.75893	0.18973	0.37947	0.75893	2.46653
16) Airborne Lead		0.00000	0.00000	0.00150	0.00300	0.00075	0.00150	0.00300	0.00974
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	1.01098	2.02197	0.50549	0.50549	2.02197	6.06591
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat		0.95486	0.00000	3.74399	0.95486	0.00000	1.73631	1.90973	9.29975
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		1.52323	0.00000	9.22761	6.18760	1.88034	5.62456	6.39425	30.83759

The ecological Risk Index Value for this region is 30.83759
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 39

RISK MATRIX - EPA Region 6
for the WESTERN GULF COASTAL PLAIN, TX & LA (34) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
ECOLOGICAL FUNCTIONS								
1) Industrial Point Discharge to Surface Waters	0.00000	0.00000	0.48356	0.00000	0.21064	0.16119	0.24178	1.09717
2) POTW Discharges to Surface Waters	0.00000	0.00000	0.99024	0.00000	0.31117	0.33008	0.49512	2.12662
3) Drinking Waters, Public & Private	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges	0.00000	0.00000	0.51067	0.00000	0.23626	0.17022	0.25533	1.17248
5) Physical Degradation of Water & Wetlands	0.90162	0.00000	0.87682	3.85804	0.90162	2.53204	2.13941	11.20955
6) Other Ground-Water Contamination	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites	0.00000	0.00000	0.27861	0.56028	0.14007	0.28014	0.42021	1.67931
9) CERCLA Hazardous Waste Sites	0.00000	0.00000	0.00343	0.00686	0.00172	0.00343	0.00515	0.02059
10) Other Waste - Municipal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases	0.00000	0.00000	0.45027	0.93745	0.23575	0.47149	0.00000	2.09496
13) Application of Pesticides	0.15545	0.00000	0.93270	1.24360	0.62180	2.79809	0.46635	6.21798
14) Sulfur & Nitrogen Oxides (Acid Deposition)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide	0.00000	0.00000	0.71137	1.42274	0.35568	0.91148	1.36722	4.76849
16) Airborne Lead	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
17) Particulate Matter	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants	0.00000	0.00000	1.12937	2.25874	0.56468	1.12937	1.69405	6.77621
19) Indoor Air Pollutants	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat	0.11648	0.00000	0.79652	0.23296	0.00000	0.85476	0.34944	2.35016
23) Oil & Gas	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS	1.17355	0.00000	7.16356	10.52067	3.57939	9.64229	7.43407	39.51352

The ecological Risk Index Value for this region is 39.51352
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 40

RISK MATRIX - EPA Region 6
for the MISSISSIPPI ALLUVIAL PLAIN, AR & LA (73) Ecoregion, FY90
Ecological Risk Index

ECOLOGICAL PROBLEMS	ECOLOGICAL FUNCTIONS	HYDROLOGY	O2 PRODUCTION CO2 CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	FISHERIES PRODUCTION	WILDLIFE PRODUCTION	PRIMARY PRODUCTION	ECOLOGICAL PROBLEMS RI TOTAL
1) Industrial Point Discharge to Surface Waters		0.00000	0.00000	0.37492	0.00000	0.18746	0.06249	0.06249	0.68735
2) POTW Discharges to Surface Waters		0.00000	0.00000	0.36312	0.00000	0.07953	0.06052	0.06052	0.56369
3) Drinking Waters, Public & Private		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
4) Non-point Source discharges		0.00000	0.00000	1.92564	0.00000	0.40790	0.32094	0.32094	2.97542
5) Physical Degradation of Water & Wetlands		0.95110	0.00000	0.88942	5.06503	0.95121	1.01301	0.79065	9.66041
6) Other Ground-Water Contamination		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7) Storage Tanks		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8) RCRA Hazardous Waste Sites		0.00000	0.00000	0.05669	0.14252	0.02850	0.02850	0.02850	0.28472
9) CERCLA Hazardous Waste Sites		0.00000	0.00000	0.00190	0.00476	0.00095	0.00095	0.00095	0.00951
10) Other Waste - Municipal		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11) Other Waste - Industrial		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12) Accidental Releases		0.00000	0.00000	0.14700	0.39605	0.08099	0.08171	0.00000	0.70575
13) Application of Pesticides		0.35385	0.00000	2.12310	3.53849	5.66159	4.24619	0.35385	16.27707
14) Sulfur & Nitrogen Oxides (Acid Deposition)		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
15) Ozone & Carbon Monoxide		0.00000	0.00000	0.10858	0.27144	0.05429	0.08143	0.08143	0.59717
16) Airborne Lead		0.00000	0.00000	0.00028	0.00069	0.00014	0.00014	0.00014	0.00138
17) Particulate Matter		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
18) Hazardous/Toxic Air Pollutants		0.00000	0.00000	0.45671	1.14177	0.22835	0.22835	0.22835	2.28353
19) Indoor Air Pollutants		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
20) Indoor Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
21) Radiation other than Radon		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
22) Physical Degradation of Terrestrial Ecosystems/Habitat		0.04967	0.00000	2.33530	2.13667	0.00000	1.90796	0.13566	6.56526
23) Oil & Gas		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
ECOLOGICAL FUNCTION -- RI TOTALS		1.35462	0.00000	8.78265	12.69742	7.68091	8.03219	2.06348	40.61127

The ecological Risk Index Value for this region is 40.61127
(This number is determined by adding the RI totals for Ecological Problems)

TABLE 41

**RISK MATRIX - EPA Region 6
for Region 6, FY90
Ecological Risk Index**

ECOLOGICAL REGIONS	ECOLOGICAL PROBLEMS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTAL
21) SOUTHERN ROCKIES, NM		0.0	0.1	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5
22) ARIZONA/NEW MEXICO PLATEAU, NM		0.0	0.6	0.0	6.1	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.0	0.1	0.4	0.0	0.0	0.0	0.7	0.0	9.3
23) ARIZONA/NEW MEXICO MOUNTAINS, NM & TX		0.0	0.2	0.0	2.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9
24) SOUTHERN DESERTS, NM & TX		0.0	0.7	0.0	1.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	0.0	0.5	0.0	0.1	0.2	0.0	0.0	0.0	0.2	0.0	3.8
25) WESTERN HIGH PLAINS, NM & TX		0.0	0.0	0.0	0.4	0.8	0.0	0.0	0.1	0.0	0.0	0.0	0.1	8.2	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	2.5	0.0	12.4
26) SOUTHWESTERN TABLELANDS, TX & OK		0.0	0.2	0.0	1.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.6	0.0	4.8
27) CENTRAL GREAT PLAINS, TX & OK		0.1	0.1	0.0	1.1	0.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0	12.9	0.0	0.2	0.0	0.0	0.5	0.0	0.0	0.0	3.5	0.0	19.4
28) FLINT HILLS, OK		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29) CENTRAL OKLAHOMA/TEXAS PLAINS, TX & OK		0.0	0.2	0.0	0.1	1.1	0.0	0.0	0.2	0.0	0.0	0.0	0.2	4.2	0.0	1.0	0.0	0.0	2.2	0.0	0.0	0.0	1.2	0.0	10.3
30) CENTRAL TEXAS PLATEAU, TX		0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	2.4
31) SOUTHERN TEXAS PLAINS, TX		0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.6	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.9	0.0	4.6
32) TEXAS BLACKLAND PRAIRIES, TX		0.0	1.7	0.0	0.8	1.2	0.0	0.0	0.9	0.0	0.0	0.0	0.9	7.6	0.0	2.5	0.0	0.0	6.1	0.0	0.0	0.0	9.3	0.0	30.8
33) EAST CENTRAL TEXAS PLAINS, TX		0.3	1.2	0.0	0.7	3.1	0.0	0.0	0.2	0.0	0.0	0.0	0.2	3.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.9	0.0	10.3
34) WESTERN GULF COASTAL PLAIN, TX & LA		1.1	2.1	0.0	1.2	11.2	0.0	0.0	1.7	0.0	0.0	0.0	2.1	6.2	0.0	4.8	0.0	0.0	6.8	0.0	0.0	0.0	2.4	0.0	39.5
35) SOUTH CENTRAL PLAINS, TX, LA & AR		0.3	0.8	0.0	0.3	6.1	0.0	0.0	0.3	0.0	0.0	0.0	0.2	1.6	0.0	0.3	0.0	0.0	1.7	0.0	0.0	0.0	13.1	0.0	24.8
36) OUACHITA MOUNTAINS, AR & OK		0.0	0.0	0.0	0.9	3.6	0.0	0.0	0.2	0.0	0.0	0.0	0.2	1.6	0.0	0.0	0.0	0.0	3.8	0.0	0.0	0.0	8.5	0.0	18.8
37) ARKANSAS VALLEY, AR & OK		0.0	0.1	0.0	1.8	3.2	0.0	0.0	0.1	0.0	0.0	0.0	0.1	2.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	4.7	0.0	13.6
38) BOSTON MOUNTAINS, AR & OK		0.0	0.0	0.0	0.3	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	6.2	0.0	13.1
39) OZARK HIGHLANDS, AR & OK		0.0	0.1	0.0	0.0	3.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	1.5	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	4.3	0.0	11.3
40) CENTRAL IRREGULAR PLAINS, OK		0.6	0.5	0.0	2.0	1.1	0.0	0.0	0.6	0.3	0.0	0.0	1.6	10.2	0.0	0.0	0.0	0.0	8.6	0.0	0.0	0.0	4.3	0.0	29.9
65) SOUTHEASTERN PLAINS, LA (65 & 75)		1.6	2.6	0.0	2.7	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	8.0
73) MISSISSIPPI ALLUVIAL PLAIN, AR & LA		0.7	0.6	0.0	3.0	9.7	0.0	0.0	0.3	0.0	0.0	0.0	0.7	16.3	0.0	0.6	0.0	0.0	2.3	0.0	0.0	0.0	6.6	0.0	40.6
74) MISSISSIPPI VALLEY LOESS PLAIN		0.5	0.6	0.0	2.1	0.0	0.0	0.0	0.8	0.0	0.0	0.0	2.9	0.0	0.0	6.4	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	19.1
ECOLOGICAL PROBLEM -- TOTALS		5.3	12.4	0.0	34.7	53.5	0.0	0.0	6.2	0.4	0.0	0.0	9.7	81.9	0.0	17.0	0.0	0.1	45.9	0.0	0.0	0.0	70.2	0.0	

- 1) Industrial Point Discharge to Surface Waters
- 4) Non-point Source discharges
- 7) Storage Tanks
- 10) Other Waste - Municipal
- 13) Application of Pesticides
- 16) Airborne Lead
- 19) Indoor Air Pollutants
- 22) Physical Degredation of Terrestrial Ecosystems/Hab

- 2) POTW Discharges to Surface Waters
- 5) Physical Degradation of Water & Wetlands
- 8) RCRA Hazardous Waste Sites
- 11) Other Waste - Industrial
- 14) Sulfur & Nitrogen Oxides (Acid Deposition)
- 17) Particulate Matter
- 20) Indoor Radon
- 23) Oil & Gas

- 3) Drinking Waters, Public & Private
- 6) Other Ground-Water Contamination
- 9) CERCLA Hazardous Waste Sites
- 12) Accidental Releases
- 15) Ozone & Carbon Monoxide
- 18) Hazardous/Toxic Air Pollutants
- 21) Radiation other than Radon

VI. DISCUSSIONS

Discussion of Residual Ecological Risk Posed by Each Problem

Industrial Point Source Discharge to Surface Waters

The risk index information contained in Table 3 reflects information provided by the water programs from each state's 305(b) report. Areas of impact are those stream segments in each ecoregion that are not meeting water quality standards due, at least in part, to industrial point source discharges. The ecoregions with the highest risk index values are those with the greatest percentage of stream miles impaired by industrial point source discharges (Table 42). Consequently, the Western Gulf Coastal Plains, the Mississippi Alluvial Plains, the Southeastern Plains and Central Irregular Plains of Oklahoma have the highest risk index values, which is visually portrayed by Map 2.

POTW Discharges to Surface Waters

Like the industrial point source problem, the information contained in Table 4 reflects information contained in the states 305(b) reports. Areas of impact are those stream segments in each ecoregion that are not meeting water quality standards due, at least in part, to POTW discharges to surface water. The ecoregions with the highest risk index values are those with the greatest percentage of stream miles impaired by POTW discharges (Table 42). As a result, the Western Gulf Coastal Plain, Southeastern Plains, East Central Texas Plains, and Texas Blackland Prairies are the ecoregions at greatest risk due to POTW discharges, which is visually depicted in Map 3.

Non-Point Source Discharges to Surface Waters

Like the aforementioned water problems, the information obtained in Table 5 reflects information obtained in the states 305(b) reports. Areas of impact are those stream segments in each ecoregion that are not meeting water quality standards due, at least in part, to non-point source problems. Unlike the aforementioned problems, ecoregions with the highest risk index values are not those with the greatest percentage of stream miles impacted, although they are close to the top of the list. The ecoregions with the greatest risk index values are the Southern Rockies and Arizona/New Mexico Plateau which is visually portrayed by Map 4. This ranking appears to be due not only to percentages of stream miles (Table 42) impacted but also due to the vulnerability of the ecoregions (Table 44).

Physical/Degradation of Water and Wetlands

The information contained in Table 6 reflects information extracted from Fish and Wildlife Service (FWS) reports. Area of impact is the estimated remaining acreage of wetlands per ecoregion. In some cases it is not possible to locate information on an ecoregion basis. Specifically it was not possible to discern acreage amounts in the Southeastern Plains and Mississippi Valley Loess Plains. This is unfortunate because both ecoregions are known to contain extensive acreage of wetlands. Excluding these two areas, the ecoregions with the greatest risk index values are the Western Gulf Coastal Plain and Mississippi Alluvial Plain

(Map 5). These high values reflect the high percentage of these ecoregions remaining in wetland acreage (approximately twenty percent).

RCRA Hazardous Waste Sites

The values in the matrix (Table 7) reflect information provided by the RCRA program. The distribution of 389 RCRA facilities was plotted on an ecoregion map by program personnel and provided to the workgroup. Those ecoregions with the greatest number of facilities have the greatest risk index values. The Western Gulf coastal Plains (with over one third of all RCRA facilities), the Texas Blackland Prairies, the Central Irregular Plains and the Mississippi Valley Loess Plain all ranked high due to the large number of facilities. This is visually portrayed in Map 6.

CERCLA Hazardous Waste Sites

The risk index information in Table 8 contains risk index values for fourteen ecoregions, each of which contains at least one CERCLA site. Information was provided by the program on actual size of each site plus an estimated off-site zone of impact of one mile in radius around each facility. Those ecoregions with the highest risk index values were those with the greatest percentage of ecoregion impacted (Table 42). However, the high vulnerability of the central Irregular Plains also contributed to its high ranking (Table 44). The distribution of residual risk from CERCLA sites across the region is visually depicted on Map 7.

Accidental Releases

The accidental releases category included essentially any contaminants accidentally released into the environment during transport or production. The distribution of residual risk from accidental releases occurs in most ecoregions within EPA Region 6 (Map 8). Information was provided by the program which described the average size of each spill site and the frequency of occurrences by county. We projected impacts based upon a 50-year period. The ecoregions with the highest risk index values were the Mississippi Valley Loess Plain of Louisiana, the Western Gulf Coastal Plain of Texas and the Central Irregular Plains of Oklahoma (Table 9).

Application of Pesticides

The application of pesticides and herbicides occurs across most ecoregions but it is particularly widespread in the Mississippi Alluvial Plain, Western High Plains, Central Great Plains and Central Irregular Plains of Oklahoma. High percentages of these areas are in agricultural production. Consequently, they have high risk index values (Table 10). The distribution of residual risk for application of pesticides across the region is shown by Map 9.

Ozone and Carbon Monoxide

These discharges were only considered problems when there were non-attainment areas for ozone or carbon monoxide. There were non-attainment areas for these pollutants in ten ecoregions as shown in Table 11 and depicted on Map 10. The Western Gulf Coastal Plain, Mississippi Valley Loess Plains, and Texas Blackland Prairies have the highest risk index values primarily due to higher percentages of area impacted (Table 42).

Airborne Lead

The discharge of airborne lead as it is currently defined, is restricted to those immediate areas around lead smelters. There are only four such smelters in the five state area and they are located in two ecoregions (Table 12) the Texas Blackland Prairie and Mississippi Valley Alluvial Plain. Consequently, Map 11 only depicts two ecoregions where airborne lead may pose an ecological risk.

Particulate Matter

Discharges of particulate matter are only considered to pose ecological risk if non-attainment areas are present. Only three ecoregions contain non-attainment zones including the Arizona/New Mexico Plateau, the Southern Deserts and Western High Plains. Again, the risk index values (Table 13) appear to be significantly determined by the percentage of ecoregion that is impacted (Table 42). Map 12 portrays the geographic distribution of ecological risk per ecoregion due to particulate matter.

Toxic Air Pollutants

The discharge of toxic air pollutants occurs at some locations within most ecoregions. Consequently, there are risk index values for all but four ecoregions (Table 14). Those ecoregions which appear to be of greatest ecological risk include the Central Irregular Plains of Oklahoma, the Western Gulf Coastal Plains, the Texas Blackland Prairies and the Mississippi Valley Loess Plains (Map 13). These areas have high risk index values due to the potential to impact large areas of each of these ecoregions.

Physical Degradation of Terrestrial Ecosystems

The definition of physical degradation of terrestrial ecosystems did not specify the activities to be considered in evaluating the scope of this problem. To a great extent, the activities we considered only included those that we could locate some type of databases within the time allowed to complete the project. Consequently, we evaluated the potential impacts associated with agriculture (plowing and harvesting), silviculture (harvesting), and urbanization. We were unable to consider additional problems including metals mining, uranium mining, grazing and highway construction due to limitations in the databases. (However, there are discussions addressing highway construction and grazing impacts on a statewide basis in the physical degradation report provided by the program).

Evaluation of the risk posed by physical degradation requires review of three risk matrix tables (Tables 15-17) and three distribution maps (Maps 14 - 16). The agriculture matrix (Table 17) and Map 16 indicate the highest potential environmental risk due to plowing and harvesting is in the Central Oklahoma/Texas Plains, Mississippi Alluvial Plain and Central Irregular Plains. The silviculture practices of clearcutting and conversion of lands to pine monoculture has a significant impact on the environment. The risk posed by those activities tends to be centered where timber production is the greatest in the South Central Plains, Boston Mountains, and Ouachita Mountains (Table 15 and Map 14).

Urbanization is also pervasive (Table 16) but it appears to be greatest in the Texas Blackland Prairies along the Interstate Highway 35 corridor which includes the cities of Austin, Dallas, Ft. Worth and San Antonio (Map 15).

Discussion of Ranking of Environmental Problems by Ecological Risk Index Values

The ranking of problems depicted in Table 18 is determined to a great extent by the magnitude of the potential area of impact for each problem. This is apparent when the ordinal ranking in Table 18 is compared to the total areas of impact for each problem in Table 43. Specifically, the problems with the greatest areas of impact (application of pesticides, toxic air pollutants and physical degradation of terrestrial systems) rank high, while those with low areas of impact rank low. However, the degree of impact for specific problems (Table 45) also modifies the ordinal ranking. This is apparent when the area of impact for application of pesticides is compared with the area of impact for air toxic discharges (Table 43). Both of these problems potentially impact up to 42 million acres within the five state area and both are widespread across the Region, impacting nearly all ecoregions. However, the risk index value for application of pesticides is nearly double the risk index value for toxic air pollutants. This difference in risk index values appears to be due primarily to the difference in degree of impact values (Table 45). The total degree of impact value for air toxics is five while the total degree of impact value for application of pesticides is eight or nine (Table 45).

Overall it appears that the ordinal ranking is influenced most by area of impact, followed by degree of impact values and then degree of vulnerability values. This is due to the range in values, for each of these variables. The total area of impact values range from 12,000 acres (for airborne lead) to over 42 million acres (for toxic air pollutants), a difference in magnitude of approximately 3,500. This is modified by the area of ecoregion, which reduces the range from 0.01 percent of the Region impacted (for airborne lead) to greater than 11 percent of the Region (air toxics), a factor of approximately 1100. The total degree of impact values range only from 3 to 29 (Table 45), a factor of approximately 10. The total degree of vulnerability values range from 10 to 23 (Table 44), a factor of only 2.3. The result is that the range in risk index values between problems is primarily determined by area but it is modified by degree of impact and degree of vulnerability.

Discussion of Residual Ecological Risk Per Ecoregion

When all of the individual problems are viewed collectively (Table 41 and Map 17), the risk index values are greatest for the Mississippi Alluvial Plain, Western Gulf Coastal Plains, South Central Plains, Texas Blackland Prairies, and Central Irregular Plains of Oklahoma.

Each of these ecoregions has high risk index values because they are impacted by a variety of problems. The Central Irregular Plains are subject to ecological risk because of particulate matter releases, application of pesticides, CERCLA hazardous waste sites, industrial point source discharges, RCRA hazardous waste sites, toxic air pollutants and physical degradation caused by agriculture. This ecoregion is also vulnerable because of the relatively high number of terrestrial endangered species per county.

The Western Gulf Coastal Plains has a high aggregate risk index value due to POTW discharges, RCRA waste sites, toxic air pollutants, ozone and carbon monoxide releases, industrial point source discharges and physical degradation of wetlands.

The Mississippi Alluvial Plain has a high risk index value due to particulate matter releases, physical degradation of wetlands, application of pesticides, industrial point source discharges and physical degradation of terrestrial systems due to agriculture and silviculture practices. This area also has a high vulnerability value for soil erosion.

The South Central Plains has a high aggregate risk index value due to physical degradation of terrestrial systems caused by silviculture and agriculture, physical degradation of wetlands, particulate releases and numerous moderate values for other problems. This area also has a high vulnerability value for soil erosion.

The Texas Blackland Prairies has a high ecological risk index value due to airborne lead, ozone discharges, toxic air pollutants, physical degradation of terrestrial systems caused by urbanization, RCRA hazardous waste sites, POTW discharges and numerous moderate values for other problems.

Discussion of Problems Not Evaluated by the Risk Index Methodology

It was not possible to evaluate two problems at this time using the risk index methodology because of limited information on estimated areas of impact per ecoregion. These problems are other ground water contamination and underground storage tanks. The underground storage tank program provided the workgroup with an estimate of 21,400 leaking tanks in the Region, each with an estimated zone of impact of approximately one surface acre. The problem is how to distribute these estimated zones of impact per ecoregion. Until more site specific information can be obtained from State or local data sources, it will not be possible to evaluate this problem using the current risk index method. Nevertheless, it is possible to estimate the ranking by comparing total estimated area of impact with other programs which have been ranked (Table 43). The 21,400 total acreage value appears to place the underground storage tank problem within ranking of the problems with the lowest level of residual risk. This is evident when the total areas of impact for other low ranking problems are reviewed. Specifically, airborne lead has an estimated cumulative impact zone of 12,000 acres, particulate matter has an estimated cumulative impact zone of 311,000 acres and CERCLA waste sites has an estimated cumulative impact zone of 151,000 acres. Since leaking underground storage tanks are not likely to have a greater degree of impact than CERCLA sites, ranking the underground storage tank problem below the CERCLA problem is reasonable.

The ground water contamination problem differs from the underground storage tank problem, for the program was not able to identify specific sites of contaminated groundwater that were causing a problem to non-human populations. However, the program did provide the workgroup with a report that identified areas where groundwater contamination, as currently defined, could impact non-human populations. The areas of potential impact are the areas with Karst geology, the Central Texas (Edwards) Plateau and the Ozark Highlands. The problem which prevents utilization of the risk index methodology is narrowing the zone of impact to

areas which represent a realistic scope of the problem. This can likely be accomplished through accessing State and local databases. In terms of ranking this problem by category, it is not possible at this time. However, it is likely to fall into the lower half of the ordinal ranking when the data is eventually obtained.

Two other problems are not evaluated using the risk index methodology, primarily due to shortages of manpower. Comprehensive data sets were provided by the programs for other municipal waste-sites and other industrial waste-sites. Unfortunately, the workgroup member initially assigned to review and evaluate the material was unable to do so due to demanding program related assignments. The task was reassigned to two other individuals but they were also unable to complete the necessary data review due to demands placed upon the individuals by their programs.

Finally, the task of reviewing the data was undertaken by a fourth individual who was not able to complete the data review and evaluation in time to be included in this report. Throughout this project all workgroup members were frequently placed in situations of competing priorities. In all of these situations, the comparative risk project had to take a back seat to program related responsibilities. It is only due to the dedicated efforts of the workgroup members that nearly all problems were fully evaluated.

Table 42
Percent Area of Impact (A_I)
Per Problem Per Ecoregion

ECOREGIONS	ECOLOGICAL PROBLEMS	INDUSTRIAL POINT DISCHARGE	POTW DISCHARGES TO SURFACE WATERS	DRINKING WATERS PUBLIC AND PRIVATE	NON-POINT SOURCE DISCHARGES	PHYSICAL DEGRADATION OF WATER AND WETLANDS	OTHER GROUND WATER CONTAMINATION	STORAGE TANKS
21) Southern Rockies, NM		0.00	0.56	NA	27.20	0.00	ER	ER
22) Arizona/New Mexico Plateau		0.00	2.20	NA	23.20	0.83	ER	ER
23) Arizona/New Mexico Mountains		0.00	0.54	NA	16.46	0.94	ER	ER
24) Southern Deserts, NM/TX		0.00	2.87	NA	9.38	2.83	ER	ER
25) Western High Plains, NM/TX		0.00	0.00	NA	2.12	1.50	ER	ER
26) Southwestern Tablelands, TX/OK		0.00	1.10	NA	6.48	1.28	ER	ER
27) Central Great Plains, TX/OK		0.59	0.91	NA	8.18	1.39	ER	ER
28) Flint Hills, OK		0.00	0.00	NA	0.00	0.00	ER	ER
29) Central Oklahoma/Texas Plains		0.31	1.16	NA	0.38	2.05	ER	ER
30) Central Texas Plateau		0.00	0.00	NA	0.00	1.31	ER	ER
31) Southern Texas Plains		0.00	0.00	NA	0.00	1.75	ER	ER
32) Texas Blackland Prairies		0.00	7.33	NA	3.39	2.22	ER	ER
33) East Central Texas Plains		2.87	9.79	NA	5.50	6.36	ER	ER
34) Western Gulf Coast Plain, TX/LA		8.06	16.50	NA	8.51	19.36	ER	ER
35) South Central Plain, TX/LA/AR		2.26	5.85	NA	2.10	12.71	ER	ER
36) Ouachita Mountains, AR/OK		0.00	0.00	NA	6.89	6.94	ER	ER
37) Arkansas Valley, AR/OK		0.05	1.62	NA	17.80	9.14	ER	ER
38) Boston Mountains, AR/OK		0.00	0.00	NA	1.75	10.91	ER	ER
39) Ozark Highlands, AR/OK		0.00	0.57	NA	0.10	7.42	ER	ER
40) Central Irregular Plains, OK		3.30	2.93	NA	10.73	2.02	ER	ER
65) SE Plains and 75) S Coastal Plains, LA		0.00	24.50	NA	25.73	0.00	ER	ER
73) Mississippi Alluvial Plains, AR/LA		6.25	6.95	NA	32.09	24.26	ER	ER
74) Mississippi Valley Loess Plain		8.52	6.11	NA	20.62	0.00	ER	ER

ER - Estimated Ranking

NR - Not Ranked

NA - Not Applicable

Table 42 continued
Percent Area of Impact (A_I)
Per Problem Per Ecoregion

ECOREGIONS	ECOLOGICAL PROBLEMS	RCRA HAZARDOUS WASTE SITES	CERCLA HAZARDOUS WASTE SITES	OTHER WASTE MUNICIPAL	OTHER WASTE INDUSTRIAL	ACCIDENTAL RELEASES	APPLICATION OF PESTICIDES	SULFUR AND NITROGEN OXIDES
21) Southern Rockies, NM		0.00	0.00	ER	ER	5.1×10^{-3}	0.00	NR
22) Arizona/New Mexico Plateau		0.75	0.06	ER	ER	1.3×10^{-2}	0.00	NR
23) Arizona/New Mexico Mountains		0.15	0.03	ER	ER	5.5×10^{-3}	0.00	NR
24) Southern Deserts, NM/TX		0.62	0.00	ER	ER	8.8×10^{-3}	0.58	NR
25) Western High Plains, NM/TX		1.34	0.01	ER	ER	2.2×10^{-2}	25.65	NR
26) Southwestern Tablelands, TX/OK		0.07	0.00	ER	ER	1.4×10^{-2}	7.67	NR
27) Central Great Plains, TX/OK		0.86	0.06	ER	ER	1.7×10^{-2}	31.49	NR
28) Flint Hills, OK		0.00	0.00	ER	ER	0.00	0.00	NR
29) Central Oklahoma/Texas Plains		1.60	0.63	ER	ER	3.7×10^{-2}	10.58	NR
30) Central Texas Plateau		0.59	0.00	ER	ER	8.4×10^{-3}	3.38	NR
31) Southern Texas Plains		0.38	0.00	ER	ER	2.5×10^{-5}	8.28	NR
32) Texas Blackland Prairies		5.54	0.00	ER	ER	0.15	19.54	NR
33) East Central Texas Plains		1.25	0.02	ER	ER	2.6×10^{-2}	8.50	NR
34) Western Gulf Coast Plain, TX/LA		13.89	1.61	ER	ER	0.28	15.55	NR
35) South Central Plain, TX/LA/AR		0.32	0.06	ER	ER	5.4×10^{-2}	4.26	NR
36) Ouachita Mountains, AR/OK		1.28	0.27	ER	ER	3.6×10^{-2}	3.80	NR
37) Arkansas Valley, AR/OK		0.78	0.04	ER	ER	2.4×10^{-2}	6.83	NR
38) Boston Mountains, AR/OK		0.00	0.00	ER	ER	8.7×10^{-3}	0.00	NR
39) Ozark Highlands, AR/OK		1.30	0.07	ER	ER	3.2×10^{-2}	4.45	NR
40) Central Irregular Plains, OK		4.11	0.13	ER	ER	0.24	19.32	NR
65) SE Plains and 75) S Coastal Plains, LA		1.83	0.20	ER	ER	0.00	0.00	NR
73) Mississippi Alluvial Plains, AR/LA		2.83	0.09	ER	ER	0.10	35.39	NR
74) Mississippi Valley Loess Plain		6.79	0.00	ER	ER	0.32	0.00	NR

ER - Estimated Ranking

NR - Not Ranked

NA - Not Applicable

Table 42 continued
Percent Area of Impact (A_i)
Per Problem Per Ecoregion

ECOREGIONS	ECOLOGICAL PROBLEMS	OZONE AND CARBON MONOXIDE	AIRBORNE LEAD	PARTICULATE MATTER	TOXIC AIR POLLUTANTS	INDOOR RADON	RADIATION OTHER THAN RADON	PHYSICAL DEGRADATION OF TERRESTRIAL ECOSYSTEMS/HABITAT
21) Southern Rockies, NM		0.00	0.00	0.00	0.0	NA	NR	0.00
22) Arizona/New Mexico Plateau		3.10	0.00	0.34	2.53	NA	NR	7.49
23) Arizona/New Mexico Mountains		0.00	0.00	0.00	0.0	NA	NR	0.00
24) Southern Deserts, NM/TX		1.46	0.00	0.37	1.24	NA	NR	0.15
25) Western High Plains, NM/TX		0.00	0.00	0.21	2.57	NA	NR	5.09
26) Southwestern Tablelands, TX/OK		0.00	0.00	0.00	1.06	NA	NR	3.80
27) Central Great Plains, TX/OK		1.52	0.00	0.00	3.48	NA	NR	0.68
28) Flint Hills, OK		0.00	0.00	0.00	0.0	NA	NR	0.00
29) Central Oklahoma/Texas Plains		7.90	0.00	0.00	16.61	NA	NR	33.66
30) Central Texas Plateau		0.00	0.00	0.00	0.0	NA	NR	0.00
31) Southern Texas Plains		0.00	0.00	0.00	1.35	NA	NR	1.50
32) Texas Blackland Prairies		18.97	0.07	0.00	50.55	NA	NR	12.97
33) East Central Texas Plains		2.53	0.00	0.00	3.69	NA	NR	1.60
34) Western Gulf Coast Plain, TX/LA		35.57	0.00	0.00	56.47	NA	NR	2.90
35) South Central Plain, TX/LA/AR		2.16	0.00	0.00	14.20	NA	NR	77.00
36) Ouachita Mountains, AR/OK		0.00	0.00	0.00	29.47	NA	NR	68.00
37) Arkansas Valley, AR/OK		0.00	0.00	0.00	18.79	NA	NR	2.50
38) Boston Mountains, AR/OK		0.00	0.00	0.00	15.71	NA	NR	2.50
39) Ozark Highlands, AR/OK		0.00	0.00	0.00	19.69	NA	NR	1.90
40) Central Irregular Plains, OK		0.00	0.00	0.00	57.24	NA	NR	40.00
65) SE Plains and 75) S Coastal Plains, LA		0.00	0.00	0.00	6.52	NA	NR	0.00
73) Mississippi Alluvial Plains, AR/LA		2.71	0.01	0.00	22.84	NA	NR	73.00
74) Mississippi Valley Loess Plain		45.61	0.00	0.00	53.84	NA	NR	0.00

ER - Estimated Ranking

NR - Not Ranked

NA - Not Applicable

Table 43
Areas of Impact (A_i)
Per Problem Per Ecoregion

Acres in thousands							
ECOREGIONS	ECOLOGICAL PROBLEMS	INDUSTRIAL	POTW DISCHARGES	DRINKING WATERS	NON-POINT SOURCE	PHYSICAL	OTHER GROUND
		POINT DISCHARGE (STREAM MILES)	TO SURFACE WATERS (STREAM MILES)	PUBLIC AND PRIVATE	DISCHARGES (STREAM MILES)	DEGRADATION OF WATER AND WETLANDS (ACRES)	WATER CONTAMINATION (ACRES)
							STORAGE TANKS
21) Southern Rockies, NM		0.0	8.2	NA	396.1	0	ER
22) Arizona/New Mexico Plateau		0.0	105.6	NA	1103.4	200	ER
23) Arizona/New Mexico Mountains		0.0	14.2	NA	273.8	110	ER
24) Southern Deserts, NM/TX		0.0	222.0	NA	338.6	330	ER
25) Western High Plains, NM/TX		0.0	0.0	NA	92.7	486	ER
26) Southwestern Tablelands, TX/OK		0.0	81.0	NA	473.0	310	ER
27) Central Great Plains, TX/OK		55.7	86.1	NA	777.8	410	ER
28) Flint Hills, OK		0.0	0.0	NA	0.0	0	ER
29) Central Oklahoma/Texas Plains		32.5	121.5	NA	39.9	580	ER
30) Central Texas Plateau		0.0	0.0	NA	0.0	200	ER
31) Southern Texas Plains		0.0	0.0	NA	0.0	249	ER
32) Texas Blackland Prairies		0.0	335.0	NA	155.0	275	ER
33) East Central Texas Plains		130.0	443.0	NA	233.0	826	ER
34) Western Gulf Coast Plain, TX/LA		546.0	1118.1	NA	576.6	3,357	ER
35) South Central Plain, TX/LA/AR		263.4	676.0	NA	244.3	4,153	ER
36) Ouachita Mountains, AR/OK		0.0	0.0	NA	165.0	490	ER
37) Arkansas Valley, AR/OK		8.0	23.0	NA	366.4	420	ER
38) Boston Mountains, AR/OK		0.0	0.0	NA	27.1	400	ER
39) Ozark Highlands, AR/OK		0.0	14.1	NA	2.5	410	ER
40) Central Irregular Plains, OK		55.9	49.7	NA	181.9	80	ER
65) SE Plains and 75) S Coastal Plains, LA		0.0	101.0	NA	106.0	0	ER
73) Mississippi Alluvial Plains, AR/LA		572.0	554.0	NA	2937.9	5,425	ER
74) Mississippi Valley Loess Plain		35.0	45.0	NA	152.0	0	ER
TOTAL Area of Impact per Problem		1767.5	3997.5		8643.8	18,714	

ER - Estimated Ranking

NR - Not Ranked

NA - Not Applicable

Table 43 (continued)
Areas of Impact (A₁)
Per Problem Per Ecoregion

Areas of Impact (A ₁) Per Problem Per Ecoregion									
Acres in thousands		ECOLOGICAL PROBLEMS	RCRA HAZARDOUS WASTE SITES (ACRES)	CERCLA HAZARDOUS WASTE SITES (ACRES)	OTHER WASTE MUNICIPAL (ACRES)	OTHER WASTE INDUSTRIAL (ACRES)	ACCIDENTAL RELEASES (ACRES)	APPLICATION OF PESTICIDES (ACRES)	SULFUR AND NITROGEN OXIDES (ACRES)
ECOREGIONS									
21)	Southern Rockies, NM		0	0	ER	ER	0.32	0	NR
22)	Arizona/New Mexico Plateau		181	14	ER	ER	3.04	0	NR
23)	Arizona/New Mexico Mountains		18	4	ER	ER	0.64	0	NR
24)	Southern Deserts, NM/TX		272	0	ER	ER	3.84	256	NR
25)	Western High Plains, NM/TX		435	4	ER	ER	7.20	8,299	NR
26)	Southwestern Tablelands, TX/OK		18	0	ER	ER	3.36	1,854	NR
27)	Central Great Plains, TX/OK		254	19	ER	ER	4.96	9,300	NR
28)	Flint Hills, OK		0	0	ER	ER	0.0	0	NR
29)	Central Oklahoma/Texas Plains		453	8	ER	ER	10.72	2,996	NR
30)	Central Texas Plateau		90	0	ER	ER	1.28	515	NR
31)	Southern Texas Plains		54	0	ER	ER	3.52	1,180	NR
32)	Texas Blackland Prairies		688	0	ER	ER	18.40	2,424	NR
33)	East Central Texas Plains		163	2	ER	ER	3.36	1,105	NR
34)	Western Gulf Coast Plain, TX/LA		2,409	28	ER	ER	48.48	2,696	NR
35)	South Central Plain, TX/LA/AR		106	19	ER	ER	17.76	1,393	NR
36)	Ouachita Mountains, AR/OK		90	19	ER	ER	2.56	268	NR
37)	Arkansas Valley, AR/OK		36	2	ER	ER	1.12	314	NR
38)	Boston Mountains, AR/OK		0	0	ER	ER	0.32	0	NR
39)	Ozark Highlands, AR/OK		72	4	ER	ER	1.76	246	NR
40)	Central Irregular Plains, OK		163	17	ER	ER	9.60	767	NR
65)	SE Plains and 75) S Coastal Plains, LA		18	2	ER	ER	0.0	0	NR
73)	Mississippi Alluvial Plains, AR/LA		634	20	ER	ER	22.56	7,934	NR
74)	Mississippi Valley Loess Plain		109	0	ER	ER	5.12	0	NR
TOTAL Area of Impact per Problem			6,263	151			169.92	41,552	

ER - Estimated Ranking

NR - Not Ranked

NA - Not Applicable

Table 43 (continued)
Areas of Impact (A_i)
Per Problem Per Ecoregion

Table 43 (continued)								
Areas of Impact (A _I)								
Per Problem Per Ecoregion								
Acres in thousands								
ECOREGIONS	ECOLOGICAL PROBLEMS	OZONE AND CARBON MONOXIDE (ACRES)	AIRBORNE LEAD (ACRES)	PARTICULATE MATTER (ACRES)	TOXIC AIR POLLUTANTS (ACRES)	INDOOR RADON	RADIATION OTHER THAN RADON	PHYSICAL DEGRADATION OF TERRESTRIAL ECOSYSTEMS/HABITAT
21) Southern Rockies, NM		0	0	0	0	NA	NR	0
22) Arizona/New Mexico Plateau		744	0	81	608	NA	NR	470
23) Arizona/New Mexico Mountains		0	0	0	0	NA	NR	0
24) Southern Deserts, NM/TX		639	0	162	544	NA	NR	67
25) Western High Plains, NM/TX		0	0	68	832	NA	NR	1,647
26) Southwestern Tablelands, TX/OK		0	0	0	256	NA	NR	919
27) Central Great Plains, TX/OK		449	0	0	1,024	NA	NR	202
28) Flint Hills, OK		0	0	0	0	NA	NR	0
29) Central Oklahoma/Texas Plains		2,238	0	0	4,704	NA	NR	9,537
30) Central Texas Plateau		0	0	0	0	NA	NR	0
31) Southern Texas Plains		0	0	0	192	NA	NR	219
32) Texas Blackland Prairies		2,354	9	0	6,272	NA	NR	1,610
33) East Central Texas Plains		329	0	0	480	NA	NR	211
34) Western Gulf Coast Plain, TX/LA		6,168	0	0	9,792	NA	NR	505
35) South Central Plain, TX/LA/AR		706	0	0	4,640	NA	NR	25,200
36) Ouachita Mountains, AR/OK		0	0	0	2,080	NA	NR	4,834
37) Arkansas Valley, AR/OK		0	0	0	864	NA	NR	116
38) Boston Mountains, AR/OK		0	0	0	576	NA	NR	92
39) Ozark Highlands, AR/OK		0	0	0	1,088	NA	NR	108
40) Central Irregular Plains, OK		0	0	0	2,272	NA	NR	1,600
65) SE Plains and 75) S Coastal Plains, LA		0	0	0	64	NA	NR	0
73) Mississippi Alluvial Plains, AR/LA		608	3	0	5,120	NA	NR	16,429
74) Mississippi Valley Loess Plain		732	0	0	864	NA	NR	0
TOTAL Area of Impact per Problem		14,668	12	311	42,272			63,770

ER - Estimated Ranking

NR - Not Ranked

NA - Not Applicable

TABLE 44

Vulnerability Values for Each

ECOREGION by FUNCTION

EPA Region 6

Ecoregions

	ECOREGIONS	HYDROLOGY	O ₂ PRODUCTION CO ₂ CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	AQUATIC ORGANISM PRODUCTION	TERRESTRIAL ORGANISM PRODUCTION	PRIMARY PRODUCTION	CUMULATIVE VULNERABILITY VALUE
1) Colorado Plateaus		0	0	0	0	0	0	0	0
2) Southern Rockies	21	4	0	5	1	1	4	3	18
3) New Mexico Plateau	22	4	0	5	1	2	4	5	21
4) New Mexico Mountains	23	4	0	5	1	5	5	3	23
5) Southern Deserts	24	5	0	5	1	1	4	5	21
6) Western High Plains	25	5	0	3	2	1	1	4	16
7) Southwestern Tablelands	26	3	0	3	2	1	1	4	14
8) Central Great Plains	27	3	0	2	3	3	3	4	18
9) Flint Hills	28	1	0	2	3	1	3	4	14
10) Central OK/TX Plains	29	2	0	2	3	1	3	4	15
11) Central Texas Plateau	30	3	0	3	3	1	2	3	15
12) Southern Texas Plains	31	3	0	3	3	1	2	3	15
13) Texas Blackland Prairie	32	2	0	2	4	1	2	4	15
14) East Central TX Plains	33	2	0	2	4	1	2	3	14
15) Western Gulf Coastal Pln	34	1	0	2	4	1	2	3	13
16) South Central Plains	35	2	0	3	4	1	2	2	14
17) Ouachita Mountains	36	2	0	3	4	1	3	2	15
18) Arkansas Valley	37	1	0	2	3	1	2	1	10
19) Boston Mountains	38	1	0	3	3	1	3	2	13
20) Ozark Highlands	39	1	0	3	3	1	2	2	12
21) Central Irregular Plains	40	1	0	3	3	1	5	3	16
22) Southeastern Plains	65	1	0	2	5	1	4	2	15
23) Mississippi Alluvial Plain	73	1	0	2	5	1	1	1	11
24) Mississippi Valley Loess	74	1	0	2	5	1	1	2	12
25) Southern Coastal Plain	75	1	0	2	5	1	1	1	11

TABLE 45
Degree of Impact (D_I)
Values for Each Function
and Each Problem

	ECOLOGICAL FUNCTIONS	HYDROLOGY	O ₂ PRODUCTION CO ₂ CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	AQUATIC ORGANISM PRODUCTION	TERRESTRIAL ORGANISM PRODUCTION	PRIMARY PRODUCTION	CUMULATIVE DEGREE OF IMPACT VALUE
1) Industrial Point Discharges to Surface Waters	a.	0	0	3	0	3	1	1	8
	b.	0	0	3	0	2	1	1	7
	c.	0	0	3	0	1	1	1	6
2) POTW Discharges to Surface Waters	a.	0	0	3	0	3	1	1	8
	b.	0	0	3	0	2	1	1	7
	c.	0	0	3	0	1	1	1	6
3) Drinking Waters, Public and Private		NA	NA	NA	NA	NA	NA	NA	
4) Non-Point Source Discharges	a.	0	0	3	0	3	1	1	8
	b.	0	0	3	0	2	1	1	7
	c.	0	0	3	0	1	1	1	6
5) Physical Degradation of Water and Wetlands	a.	4	0	2	4	4	4	3	21
	b.	4	0	2	4	4	4	4	22
	c.	4	0	3	2	4	4	4	21
	d.	5	0	2	6	5	6	5	29
6) Other Ground-Water Contamination									
7) Storage Tanks		ER	ER	ER	ER	ER	ER	ER	
8) RCRA Hazardous Waste Sites	a.	0	0	1	1	1	1	1	5
	b.	0	0	2	4	4	4	4	18

TABLE 45 (continued)
Degree of Impact (D₁)
Values for Each Function
and Each Problem

	ECOLOGICAL FUNCTIONS	HYDROLOGY	O ₂ PRODUCTION CO ₂ CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	AQUATIC ORGANISM PRODUCTION	TERRESTRIAL ORGANISM PRODUCTION	PRIMARY PRODUCTION	CUMULATIVE DEGREE OF IMPACT VALUE
9) CERCLA Hazardous Waste Sites	a.	0	0	1	1	1	1	1	5
	b.	0	0	2	4	4	4	4	18
10) Other Waste-Municipal		ER	ER	ER	ER	ER	ER	ER	
11) Other Waste-Industrial		ER	ER	ER	ER	ER	ER	ER	
12) Accidental Releases	a.	0	0	1	1	1	1	0	4
	b.	0	0	2	2	2	2	0	8
	c.	0	0	1	2	2	2	0	7
	d.	0	0	1	1	0	1	0	3
	e.	0	0	1	0	0	1	0	2
	f.	0	0	0	0	0	1	0	1
	g.	0	0	0	0	1	1	0	2
	h.	0	0	1	0	1	1	0	3
	i.	0	0	0	0	1	0	0	1
	j.	0	0	1	1	1	0	0	3
	k.	0	0	0	1	1	1	0	3
13) Application of Pesticides	a.	0	0	1	1	3	3	0	8
	b.	1	0	2	1	1	3	1	9
14) Sulfur and Nitrogen Oxides (Acid Deposition)		NR	NR	NR	NR	NR	NR	NR	

TABLE 45 (continued)
Degree of Impact (D_I)
Values for Each Function
and Each Problem

	ECOLOGICAL FUNCTIONS	HYDROLOGY	O ₂ PRODUCTION CO ₂ CONSUMPTION	FILTERING/ DETOXIFYING POLLUTANTS	SOIL PRODUCTION	AQUATIC ORGANISM PRODUCTION	TERRESTRIAL ORGANISM PRODUCTION	PRIMARY PRODUCTION	CUMULATIVE DEGREE OF IMPACT VALUE
15) Ozone and Carbon Monoxide	a.	0	0	1	1	1	1	1	5
	b.	0	0	1	1	1	2	2	7
16) Airborne Lead		0	0	1	1	1	1	1	5
17) Particulate Matter		0	0	1	1	1	1	1	5
18) Hazardous Toxic Air Pollutants		0	0	1	1	1	1	1	5
19) Indoor Air Pollutants		NA	NA	NA	NA	NA	NA	NA	
20) Indoor Radon		NA	NA	NA	NA	NA	NA	NA	
21) Radiation Other than Radon		NR	NR	NR	NR	NR	NR	NR	
22) Physical Degradation of Terrestrial Ecosystems/Habitat	a.	0	0	2	0	0	2	0	4
	b.	0	0	4	4	0	4	4	16
	c.	0	0	1	1	0	1	0	3
	d.	0	0	3	2	0	4	0	9
	e.	4	0	4	1	4	4	4	21
	f.	4	0	3	2	4	4	4	21

Discussion of Concerns Relative to Databases

A review of Table 43 points to areas of concern relative to potential problems with existing databases.

With regard to physical degradation of water and wetlands, it is interesting to note that no acreage values have been provided or estimated, for the Southern Rockies, Flint Hills, Southeastern Plains or Mississippi Valley Loess Plain. One would expect a small acreage of wetlands in the Flint Hills and Southern Rockies. It is known that extensive wetland acreage exists in the Southeastern Plains and Mississippi Valley Loess Plain. The wetland risk index map and matrix reflect these inherent biases.

Another data set which should be viewed with some degree of caution, relates to application of pesticides. Again, no estimated or reported values were available for the Southeastern Plains, Mississippi Valley Loess Plain, Flint Hills and Southern Rockies. In addition, no values were reported for the Arizona/New Mexico Plateau, Arizona/New Mexico Mountains and Boston Mountains. Many of these areas have limited acreages in plowed agricultural land but concern exists primarily in the Southeastern Plains, Mississippi Valley Loess Plain and Flint Hills, where some agricultural activities are known to exist.

As a result of the aforementioned issues, the risk posed by the twenty-two problems may not be accurately reflected in this analysis. The risk to the Southeastern Plains is probably greater than that indicated by the composite ranking (Table 41). Furthermore, the limited risk posed to the Flint Hills appears to merit further investigation. The databases utilized indicate there is no risk to the Flint Hills as the problems are currently defined.

Another concern relates to the water discharge problems. The information used to evaluate the POTW, industrial and non-point source problems dealt only with impacts to streams not lakes or reservoirs. Data is available in the State 305 (b) reports on lakes, which are having water quality problems. However, we did not have acreage values available for lake acreage per ecoregion. Consequently, impacts to lakes were not evaluated as part of the ranking exercise. When this analysis is conducted, the risk index values may increase for POTW, industrial and non-point source problems.

Discussion of Geographic Areas Which Were Not Evaluated

There are a several geographic areas which were not evaluated by this analysis, including: near coastal waters, the continental shelf, deep waters of the Gulf and problems of global scale.

Of particular concern are problems which go beyond the scale of ecoregion impacts

which are not ranked at the ecoregion level. Such problems include stratospheric ozone depletion and global warming. The research in those areas indicates that climatic changes over the next century will result in increased temperatures. These problems should be of particular concern to this Region because:

1. we have a large number of air toxic discharges in Region 6 which may contribute significantly to global atmospheric problems;
2. we have a high percentage of the nation's coastal wetland resources which could be lost due to temperature increase and the associated sea level rise;
3. stratospheric ozone depletion and the resultant increase in Ultraviolet radiation could erode the foundation of the marine food web (marine organism larvae and phytoplankton) again impacting on the Regions wetlands;
4. and, the basic factors which determine ecoregion boundaries in our Region are primarily determined by climate, changes in climate causing shifting of these boundaries would have devastating consequences.

The risk associated with climatic change appears to be very high with lasting damage to the environment.

Uncertainty

In order to complete the objective of relative ranking of the residual risk posed by the twenty-two problems defined by EPA Headquarters, many assumptions were made. Some assumptions were made because an established methodology for evaluating ecological risk has yet to be developed, others were made because data was not readily available. It soon became apparent that the best we could do was document our path and record assumptions along the way because there was uncertainty at every step. To some extent the methodology utilized was contingent upon the availability of data, time and manpower. It is within these constraints that this report and its products were developed.

In this section of the report we intend to review and discuss some of the major assumptions that were made in order to complete this project. The types of assumptions fall into several categories: method assumptions, model assumptions and data assumptions. We have attempted to inventory our major assumptions and they are detailed in Tables 46-49. The following sections discuss the basic major assumptions and their implications in greater detail.

Method Assumptions

Our first major decision was to determine at what level to evaluate ecological risk. Regions 1, 3 and 10 chose to evaluate risk at the ecosystem level in their evaluations

but it seemed to some of us on the workgroup that the ecoregion might be a more appropriate initial evaluation level. We believed that we could obtain databases on specific ecoregions, and we could locate them on a map. At this point in time we do not know the geographic location of all the ecosystems/communities that lie within each ecoregion nor do we have much ecosystem specific data.

Our basic assumption is that ecological risk exists when ecological stress (posed by any one of the twenty-two problems) impairs the ability of an ecoregion to perform basic ecological functions. There are innumerable alternative routes that could have been taken including selecting specific chemicals and specific indicator or keystone species as receptors, then evaluating the impact of each chemical discharge upon each indicator species. This approach holds a great deal of promise, but we could not agree upon which chemicals to select or which species to select. In addition, this approach can not evaluate risk caused by physical degradation of wetlands or physical degradation of terrestrial ecosystems. Furthermore, such an approach appears to be more oriented to evaluation of populations and communities, not large landscape units.

We made the decision to evaluate impact on a functional scale. One could argue that fewer or more ecological functions should be addressed, we would agree with the reader. Consequently, we leave it to future workgroups to refine or modify the current functional evaluation approach.

To assist in our ranking of stressors, we eventually identified variables that were common to all twenty-two problems, which would vary from one problem to the next and could be measured or estimated. These variables were area of impact and degree of impact. We also added the variable, degree of vulnerability, to account for differences in sensitivity from one ecoregion to the next. Other variables could definitely be considered including intensity, reversibility, and duration. To an extent these variables are already incorporated in the degree of impact and degree of vulnerability variables but inclusion as separate variables appears to hold a great deal of merit for future investigation.

Model Assumptions

We combined the variables in a mathematical model depicted in Figure 3, creating in the process, a set of underlying assumptions, including:

- 1) As the area of impact increases, the level of ecological risk increases.
- 2) As the degree of impact increases (intensity and duration of impact) the level of risk increases.
- 3) As the degree of vulnerability increases, the level of ecological risk increases.

These assumptions appear to be consistent with the recent report published by EPA's Science Advisory Board (1990), however, we question whether risk should always increase in a linear manner.

Other broad assumptions underlying our approach include those identified in Table 47. As indicated in Table 47, many of these assumptions were made due to limitations in

availability of time, manpower, and databases. These assumptions can be relaxed in future years as the databases become available.

Area of Impact Assumptions

Table 48 contains an inventory of assumptions that were made in the process of identifying the area of impact for each problem evaluated. The assumptions are arranged by problem with a brief explanation of why the assumption was made. Of particular interest is the variation in assumed potential zones of impact for some problems. Specifically, RCRA sites are assumed to have potential impact within a three mile radius of a site, CERCLA sites are assumed to have a potential impact within a one mile radius of the site, airborne lead is assumed to have a potential impact within a two kilometer radius of a site, and toxic air pollutants are assumed to have an impact within a four mile radius of a site. These assumptions were provided by each program. We question why this variation in zones of impact exists from one program to the next. Review of the assumptions also indicates that the risk index values we have generated reflect maximum potential zones of impact because we did not have the site specific data readily available from the programs. As the specific data is obtained on actual zones of impact, we would expect residual risk for RCRA sites, airborne lead, CERCLA sites, and toxic air pollutants to be reduced.

Vulnerability Assumptions

Assumptions were made when vulnerability values were developed for each ecoregion. The assumptions relate to development of environmental indicators of vulnerability and to assumptions underlying the ranking system. These assumptions are detailed in Table 49. Note that the assumptions are listed along with some information on why the assumptions were made. As was the case with the area assumptions, many of them were made because data was not readily available. In future years, some of these assumptions can be relaxed as data becomes available.

Table 46 Method Assumptions

Assumptions

- 1) Residual ecological risk can be evaluated at the ecoregion level.
- 2) Ecological risk exists at an ecoregion level, when ecological stress (posed by environmental problems), impairs the ability of an ecoregion to perform basic ecological functions.
- 3) Ecological risk at an ecoregion level can be estimated by evaluating potential impacts to the following ecological functions.
 - a) distribution of water, minerals and nutrients via the hydrologic cycle;
 - b) oxygen production and carbon dioxide consumption;
 - c) filtering and detoxifying of pollutants;
 - d) soil production and maintenance;
 - e) production of aquatic organisms;
 - f) production of terrestrial organisms; and
 - g) conversion of energy (sunlight) into organic matter;
- 4) Residual risk to each function can be estimated by measuring or approximating area of impact of each problem, degrees of impact to each function and degree of vulnerability for each function.

Table 47 Model Assumptions

Assumptions	Quality of Assumptions	Why Assumption was Made/ Comments
1. As area of impact increases, level of risk increases.	Reasonable	
2. As degree of impact increases, (intensity and duration of impact), level of risk increases.	Reasonable	
3. As it becomes more difficult to reverse environmental damage, risk increases.	Reasonable	
4. Vulnerability is the same throughout each ecoregion for each ecological function.	Needs to be improved	Limitations in availability of data, manpower and time prevent obtaining data at a county level.
5. All ecological functions are weighted equally.	Needs to be improved	Based upon the information and time we currently have available this is a reasonable assumption.
6. Residual risk occurs only when established standards are violated or when no standard exists.	Needs to be improved	
7. On an ecoregion scale, all areas of impact are of equal ecological value.	Needs to be improved	To relax this assumption we need to obtain more data.
8. When ecological impact occurs, it occurs uniformly throughout the area of impact.	Needs to be improved	To relax this assumption we need site specific data especially concerning point source discharges. Not enough manpower and time, to do this review.
9. At an ecoregion scale, risk can be evaluated by determining which basic ecological functions are impaired.	Needs to be improved	
10. Vulnerability of an ecoregion can be adequately represented by soil erosion, endangered species, primary productivity rates, assimilative capacities and stream density.	Needs to be improved	

Table 48 Area of Impact Assumptions

PROBLEM	ASSUMPTIONS	QUALITY OF ASSUMPTIONS	Why ASSUMPTION was Made/Comments	DATA Sources
1. Industrial Point Source Discharge to Surface Waters.	Area of impact is the number of stream miles per ecoregion not achieving water quality standards due to industrial discharges.	Reasonable.	Relied predominately upon State 305(b) reports with confirmation by 304(l) list.	State 305(b) and 304(l) reports.
	Any partial violation of standards reported in State 305(b) reports results in impact to fish and wildlife propagation.	Can be improved.	Assumption is inherent in the State 305(b) reports. We don't know which specific standards are violated and our interest in this report is non-human populations.	State 305(b) reports.
2. POTW discharges to Surface Waters.	Area impact is the number of stream miles per ecoregion not achieving water quality standards due to POTW discharges.	Reasonable.	Relied predominantly upon State 305(b) reports	State 305(b) report.
	Any partial violation of standards reported in State 305(b) reports results in impact to fish and wildlife propagation.	Can be improved.	Assumption is inherent in the State 305(b) reports. We don't know which specific standards are violated and our interest in this report is non-human populations.	State 305(b) report.
3. Non-Point Source Discharges to Surface Waters.	Area of impact is the number of stream miles per ecoregion not achieving water quality standards due to non-point source discharges.	Reasonable.	Relied predominantly upon State 305(b) reports with confirmation by 319 reports.	State 305(b), and 319 reports.
	Any partial violation of standards reported in State 305(b) reports results in impact to fish and wildlife propagation.	Can be improved.	Assumption is inherent in the State 305(b) reports. We don't know which standards are violated and our interest in this report is non-human populations.	State 305(b) and 319 reports.

Table 48 Area of Impact Assumptions

PROBLEM	ASSUMPTIONS	QUALITY OF ASSUMPTIONS	Why ASSUMPTION was Made/Comments	DATA Sources
4. Drinking Water	There is no area of impact to non-human populations.	Reasonable.	As currently defined this problem deals strictly with human populations.	
5. Physical degradation of water and wetlands.	Area at risk is remaining wetland base within the Region. Riparian wetland acreage per ecoregion is distributed on the basis of stream miles.	Reasonable.	We have tremendous wetland loss rates in the Region especially with coastal wetlands and bottomland hardwoods. Riparian wetlands are narrow corridors adjacent to streams. This was a data assumption to determine area of impact for western ecoregions.	U.S. Fish and Wildlife Service reports and many others (see program report)
6. Other groundwater contamination.	Areas of impact are those areas in the ecoregions where groundwater has the opportunity to interact with non-human populations (excluding wetlands).	Reasonable.	The areas of potential impact are primarily regions of Karst topography.	Report from ground-water program.
7. Storage Tanks.	The area of impact was assumed to be one surface acre per leaking tank.	Reasonable.	This assumption was made due to data, time and manpower constraints.	Report from program.
8. RCRA Hazardous Waste sites.	The area of impact consists of two zones, onsite and offsite. Onsite impact is assumed to be 50 acres per site. Offsite area of impact is assumed to be three mile radius around the site. Only those areas with EPI ranking were assumed to pose a potential ecological risk (389 sites).	Reasonable. Can be improved. Can be improved. Can be improved.	Assumption provided by the program. Site specific acreage is not readily available. Assumption provided by the program. Assumption provided by the program.	Data provided by RCRA program
9. CERCLA Sites	The area of impact consists of two zones onsite and offsite	Reasonable	Assumption provided by the program.	Information provided by the program.

Table 48 Area of Impact Assumptions

PROBLEM	ASSUMPTIONS	QUALITY OF ASSUMPTIONS	Why ASSUMPTION was Made/Comments	DATA Sources
	Offsite area of impact is assumed to be a one mile radius around the site.	Can be improved.	Assumption provided by the program.	Information provided by the program.
	Only those sites on the National Priority List are assumed to pose a potential ecological risk (79 sites).	Can be improved.	Assumption provided by the program.	Information provided by the program.
10. Other Waste Sites Municipal.	Data received from program. Evaluation needs to be completed.			
11. Other Waste Sites Industrial	Data received from program. Evaluation needs to be completed.			
12. Accidental Releases	Data received from program. Preliminary evaluation completed quality control and data entry needs to be completed.			
13. Application of Pesticides	Area of impact is area of each ecoregion subject to pesticide, herbicide or fungicide application.	Reasonable		USDA Reports.
	Area of impact per ecoregion is estimated by using county databases. Counties with more than are half of area in ecoregion are assumed to be in that ecoregion. Area of impact values per ecoregion are obtained by summarizing the application areas for the appropriate counties.	Reasonable	Data base does not exist on an ecoregion basis.	
14. Sulfur and Nitrogen Oxide discharges (acid Deposition).	Area of impact is area of each ecoregion that is in non-attainment with sulfur dioxide or nitrogen oxide standards.	Reasonable	There are currently no areas in the ecoregion that are in non-attainment with the sulfur and nitric oxide standards	

Table 48 Area of Impact Assumptions

PROBLEM	ASSUMPTIONS	QUALITY OF ASSUMPTIONS	Why ASSUMPTION was Made/Comments	DATA Sources
15. Ozone and Carbon Monoxide	Area of impact is area of each ecoregion that is in non-attainment with the ozone or carbon monoxide standards.	Reasonable	Information provided by program.	
	Area of impact is area of counties that are in non-attainment with standards.	Can be improved	Information provided by program can be improved by actual site specific assessments to determine area of impact.	
16. Airborne Lead	Area of impact is area of within 2 kilometer radius of lead smelters.	Can be improved.	Assumption provided by the program. Can be improved by actual specific assessments to determine area of impact.	Report submitted by program.
17. Particulate Matters	Area of impact is area of each ecoregion in non-attainment for particulates.	Reasonable		City and County Data Book
	Area of impact for each ecoregion is the sum of the area of each municipality in non-attainment for the particulate standard	Reasonable		City and County Data Book
	Violation of primary standard results in impact to secondary (non-human) receptors.	Reasonable	Assumption provided by the program.	

Table 48 Area of Impact Assumptions

PROBLEM	ASSUMPTIONS	QUALITY OF ASSUMPTIONS	Why ASSUMPTION was Made/Comments	DATA Sources
18. Hazardous Toxic Air Pollutant	Area of impact is 4 mile radius around each toxic discharger within each ecoregion. The area of impact for each ecoregion, is the sum of areas of impact around each discharger within that ecoregion.	Can be improved.	Assumption provided by the program. Can be improved by actual specific assessments to determine area of impact.	
19. Indoor Air Pollutants	There is no area of impact to non-human populations	Reasonable	As currently defined this problem deals only with the human population, pets, or household insects.	
20. Indoor Radon	There is no area of impact to non-human populations.	Reasonable	As currently defined this problem deals only with human populations.	
21. Radiation other than Radon	There is no known area that is subjected to radiation problems.	Reasonable	Data or impact to the non-human environment was not provided.	

Table 48 Area of Impact Assumptions

PROBLEM	ASSUMPTIONS	QUALITY OF ASSUMPTIONS	Why ASSUMPTION was Made/Comments	DATA Sources
22. Physical Degradation of Terrestrial Ecosystems				
a. Agriculture	Area of impact is area in each ecoregion that is maintained in agriculture production. This activity includes annual plowing and harvesting of vegetative cover which significantly impacts terrestrial populations and soil production. It also includes conversion of upland forest to agricultural land. Area of impact per ecoregions was estimated by using county databases. Counties with more than half of area in ecoregion are assumed to be in that ecoregion.	Reasonable	Agricultural conversion was only considered within ecoregion 35 and 73 because we only considered forested prime farmland at risk of conversion. We did not have data on other specific communities to consider at this time, e.g. prairie. Fifty year projections were made using the annual rate of conversion which was based on at least five years of data. Agricultural conservation program data was not used.	USDA reports.
b. Silviculture	Area of impact is area of each ecoregion that is projected to be converted from natural forest to pine monoculture over the next 50 years. It also includes impacts associated with clear cutting of pine monoculture stands on a 30 year cycle.	Reasonable	Annual rate of conversion is based on at least 10 years data. Area of impact per ecoregion is available because forest cover types correlates favorably with ecoregions.	USDA reports.
c. Urbanization	Area of impact is area of each ecoregion that is projected to be converted from agricultural forested areas to urbanized areas over the next 50 years.	Reasonable	Annual value of conversion is based on five years of data.	City and County Data Book

Table 49 Vulnerability Assumptions

TYPE OF ASSUMPTION	QUALITY OF ASSUMPTIONS	Why ASSUMPTION was Made/Comments	DATA Sources
A. Indicator Assumptions			
1. Stream density is an indicator of the availability of water and nutrients to non-human populations.	Reasonable.		Storet & Omernick 1986
2. The average number of endangered species per county adequately represents the vulnerability of terrestrial non-human populations.	Can be improved	Data on State species of special concern and common species is not readily available or does not exist.	U.S. Fish and Wildlife Service Data
3. The average number of endangered species county adequately per represents the vulnerability of aquatic non-human populations.	Can be improved.	Data of State species concern and common species is not readily available or does not exist.	U.S. Fish and Wildlife Service Data
4. On a regional scale, the rainfall erosion index adequately represents erosion potential.	Reasonable.		U.S.D.A. Agricultural Handbook
5. Assimilative capability of an ecoregion is adequately represented by average wind velocity values and stream flows.	Can be improved.	This was the only type of data that was readily available in the time frames allotted.	U.S.G.S. Streamflow Data. NWS wind velocity data.
6. Average net primary productivity values can be used to represent primary productivity rates.	Reasonable.		Whittaker

Table 49 Vulnerability Assumptions

TYPE OF ASSUMPTION	QUALITY OF ASSUMPTIONS	Why ASSUMPTION was Made/Comments	DATA Sources
B. Ranking Assumptions			
1. A low stream density value would indicate that the ecoregion is more vulnerable because there are fewer locations for water and nutrient dispersion for non-human populations	Reasonable.		
2. A high average number of terrestrial endangered species would indicate that the ecoregion has a greater opportunity (risk) for endangered species to be impacted.	Reasonable.		
3. A high average number of aquatic endangered species would indicate that the ecoregion has a greater opportunity (risk) for endangered species to be impacted.	Reasonable.		
4. As the rainfall erosion index increases the risk to soil production increases.	Reasonable.		
5. As mean annual wind velocity increases assimilative capacity of air pollutants increases.	Reasonable.		

Table 49 Vulnerability Assumptions

TYPE OF ASSUMPTION		QUALITY OF ASSUMPTIONS	Why ASSUMPTION was Made/Comments	DATA Sources
6.	As stream flows increase assimilative capacity for water pollutants increases.	Reasonable.		
7.	As primary productivity increases the resiliency of the ecoregion to stress increases.	Reasonable.		

VII. CONCLUSIONS

Process

Our most important product was development of an interactive process to evaluate and communicate the residual ecological risk, posed by a variety of physical and chemical environmental problems, at a regional level. The process requires documentation of decision-making by explicitly describing the risk evaluation technique (a mathematical model), enumeration of assumptions and keeping track of data sources. The real value of the process is that it can be modified, and it is repeatable. The risk evaluation approach can continue to be improved through improvement in databases, improvement in the evaluation technique (mathematical model), and removal of broad-based assumptions.

To complete our initial ranking of the residual risk posed by the twenty-two problems provided by EPA Headquarters, we took the following sequence of steps:

- 1) We evaluated residual ecological risk at ecoregion level;
- 2) We made the assumption that ecological risk exists when ecological stress (posed by any one of the twenty-two problems) impairs the ability of an ecoregion to perform basic ecological functions. The list of basic ecological functions that we identified that could be impaired includes:
 - a) distribution of water, minerals and nutrients via the hydrologic cycle,
 - b) oxygen production and carbon dioxide consumption,
 - c) filtering and detoxifying of pollutants,
 - d) soil production and maintenance,
 - e) production of aquatic organisms,
 - f) production of terrestrial organisms, and
 - g) conversion of energy (sunlight) into organic matter via photosynthesis.
- 3) With a listing of basic problems and a listing of basic ecosystem functions, we chose to evaluate ecological risk for each ecoregion by evaluating the impact of each problem on each ecological function.
- 4) We evaluated the impact of each problem on each function by using a mathematical model, that combined the variables area of impact, degree of impact and degree of vulnerability to generate a risk index value.
- 5) By using existing databases, creating new databases, and making assumptions, we estimated the distribution of each problem by ecoregion in the five state area, and generated risk index values for each problem per ecoregion. In this manner, we identified those ecoregions which were at greatest risk and identified the distribution of each problem. These results were then visually depicted using maps generated by the Region's geographic information system.
- 6) By combining risk index values across all functions for each problem, we were able to generate thirteen risk index values which could be used to rank the problems in a relative manner.

Experience in using the previously described process lead us to the following conclusions:

- 1) A mathematical index is useful in evaluating and ranking relative levels of residual ecological risk.
- 2) A geographic information system (GIS) is useful in communicating residual ecological risk, from large arrays of data, generated by a mathematical index system.
- 3) We were able to use a GIS to convey some of our results because we utilized a mathematical index and because we chose to evaluate risk at the ecoregion level (i.e. we knew the geographic location of the ecological units).

Ranking of Environmental Problems

On the basis of area of impact, degree of impact and vulnerability of each ecoregion (as previously defined), we were able to rank the residual risk posed by the environmental problems from one to thirteen. However, due to the variation in databases and nature of some of our assumptions, we feel more comfortable with grouping the problems into categories as depicted in Table 50.

Category 1 problems - physical degradation of terrestrial systems, physical degradation of wetlands and pesticide application, are those problems which were found throughout many ecoregions and in many situations could impact over one-third of individual ecoregions. The impact also tends to be significant, for these problems usually eliminate vegetative, aquatic and terrestrial populations with associated reductions in natural assimilative capacity and increased soil erosion. The magnitude of these impacts cannot be underestimated, for silviculture alone, is responsible for the conversion of 30,000 acres of lands to pine monoculture per year within areas in our Region. The acreage estimates associated with these problems tends to be much more reliable than other problems evaluated.

The Category 2 problems - non-point source discharges and toxic air pollutant discharges, to some extent, are an outgrowth of Category 1 problems. For example, non-point source stress would be expected to be great in areas with high rates of agriculture, pesticide application and urbanization. The hazardous toxic air pollution problem ranks high because of the large number of facilities discharging chemicals to this media in Region 6 (over 1300) and because it is assumed that each facility can impact over a 50 square mile area. The Category 2 problems tended to have an ecological risk index (ERI) value of 30 to 50. We believe that the risk for toxic air pollutants may decrease as site specific information becomes available. We also believe that the risk index for non-point source problems will increase as the States' non-point source assessments continue to improve. In general Category 2 problems are not regulated by existing standards or programs, and databases do not clearly define zones of impact.

Category 3 problems represent a mixture of problems which are limited in scope with ERI values in the range of 5 to 20. The areas of impact associated with these problems tend to be less than ten to twenty percent of individual ecoregions. In general, these problem areas have some established standards or State/Federal programs to control the emissions.

Table 50. Ecological Risk Rankings

Problems Posing Residual Ecological Risk

Category 1: (Highest Risk)

Physical Degradation of Terrestrial Ecosystems
Application of Pesticides
Physical Degradation of Water and Wetlands
*Global Warming
*Stratospheric Ozone Depletion

Category 2:

Non-Point Source Discharges
Hazardous / Toxic Air Pollutants

Category 3:

Ozone and Carbon Monoxide
POTW Discharges to Surface Waters
RCRA Hazardous Waste Sites
Industrial Point Discharges to Surface Waters
CERCLA Hazardous Waste Sites
*Municipal Waste Sites
*Industrial Waste Sites
*Ground Water Contamination
Accidental Releases

Category 4: (Lowest Risk)

CERCLA Hazardous Waste Sites
Particulate Matter
Airborne Lead
*Storage Tanks

*** Estimated Ranking**

Problem Areas For Which No Evidence Was
Provided To Indicate Ecological Harm:

SO₂ and NO_x , and Radiation other than radon

Problem Areas For Which The Workgroup Concluded
There Was Negligible Or No Risk:

Drinking Water (public and private), Indoor Air Pollutants, Indoor Radon

Category 4 problems represent problems of limited area or problems responsive programs in place which help to reduce the residual risk.

It is important to note that the ecological ranking is relative not absolute. Furthermore, we do not intend to convey that environmental damage is always occurring. We are simply indicating that on the basis of vulnerability of an ecoregion, estimated area of impact and relative magnitude of impact, residual risk exists and category 1 problems tend to pose the greatest threat to ecoregions in Region 6. The remaining categories tend to pose relatively lesser levels of risk for the aforementioned reasons.

Conclusions that can be drawn from our ranking of the twenty-two problems defined by EPA Headquarters are as follows:

- 1) The problems-physical degradation of wetlands, physical degradation of terrestrial systems and application of pesticides-individually pose the greatest residual risk to ecoregions in Region 6.
- 2) The problems-non-point source discharges and toxic air pollutants-individually pose the second highest level of residual risk to ecoregions in Region 6.
- 3) The problems-discharges of carbon monoxide and ozone, discharges from POTWs, discharges from RCRA sites, industrial discharges to surface waters, groundwater contamination, discharges from municipal and industrial sites, and accidental releases-individually pose a lower level of risk to ecoregions in Region 6.
- 4) The discharges-airborne lead, releases of particulate matter, discharges from CERCLA hazardous waste sites and discharges from underground storage tanks-individually pose the lowest level of risk to ecoregions in Region 6.

Problems Per Ecoregions

In addition to ranking the residual risk posed by each of the twenty-two problems, we identified which problems posed the greatest risk to each individual ecoregion. The ecoregions which were at greatest risk due to the aggregate risk of thirteen problems include:

- a) the Central Irregular Plains of Oklahoma,
- b) the Mississippi Alluvial Plain,
- c) the Texas Blackland Prairies, and
- d) the Western Gulf Coastal Plain.

Those ecoregions which were at lowest risk due to the aggregate risk of thirteen problems were:

- a) the Central Texas Plateau,
- b) the Southern Deserts,
- c) the Arizona/New Mexico Mountains, and
- d) the Southern Texas Plains.

In ecoregions faced with the greatest risk, the risk appears to be predominately caused by physical degradation of terrestrial systems, physical degradation of wetlands, hazardous air pollutants and application of pesticides. In those ecoregions faced with the least risk, the majority of residual risk appears to be caused by application of pesticides and non-point source discharges to surface waters.

VIII. RECOMMENDATIONS

Recommendations of National Implication

1. To fully evaluate ecological risk we recommend that techniques be developed to assess, evaluate and communicate ecological risk at several levels, including:
 - a) the site specific and/or population specific scale,
 - b) the community and/or ecosystem specific scale,
 - c) the ecoregion scale, and
 - d) the biospheric or global scale.

In this manner specific discharges or activities can be fully evaluated, for specific discharges or activities may not only have site specific impacts but also contribute to ecosystem, regional and global impacts. Cumulative impact evaluation should not be overlooked, nor should impacts which occur to abiotic components of the environment.

Risk evaluation techniques should be developed and refined for both chemical discharges and physical modification. Methods for combining and evaluating these diverse problems should also be developed. Once appropriate techniques have been developed, they can then be selected for usage on the basis of the objective of the risk assessment or evaluation.

2. To facilitate development of the aforementioned techniques we recommend a meeting in the near future that brings together personnel from each Region, that have developed each Region's comparative risk evaluation techniques. The purpose of such a meeting would be to compare and discuss each Region's methodology and to develop better approaches to evaluate comparative ecological risk. This workgroup of regional and headquarters personnel should also define the term comparative ecological risk.
3. A method for economic analysis of environmental risk assessment should be developed in conjunction with the development of an ecological methodology. This could enable managers to directly correlate environmental costs versus environmental benefits through marginal analysis or break-even analysis. Marginal analysis results could then be directly applied and used to justify program disinvestment and investments during the strategic planning process.
4. We recommend that our approach or a similar modified approach be used at a national level to evaluate comparative ecological risk. Specifically, we recommend:
 - a) utilization of a mathematical index to evaluate and rank residual ecological risk,
 - b) initial evaluation on an ecoregion scale to determine how relative risk is distributed across the country, and
 - c) utilization of a geographic information system, to generate maps which effectively communicate the distribution of residual ecological risk nationwide.

5. In using our approach or a modified approach, on a national level we further recommend that:
 - a) ecological functions be weighted for relative ecological importance; and
 - b) ecoregions be weighted for their importance at an interregional or national scale (for instance some regions of the country may have high concentrations of endangered or threatened species or be important to migrating populations).
6. We recommend that Regions continue to evaluate comparative residual risk at an ecoregion level but work to acquire databases so specific ecosystems can be identified and located geographically. After adequate databases have been acquired, we recommend evaluation at the ecosystem or community level. An intermediate level of evaluation may exist at a sub-ecoregion level based on vegetative cover type.
7. We recommend that all Federal natural resource agencies at the Headquarters level pool their resources to share existing natural resource databases and to identify the location of communities and ecosystems across the country.
8. After comparative ecological risk techniques (recommendation 1) and econometric resource evaluation techniques (recommendation 3) are developed, we recommend that all Federal natural resources agencies (EPA, USDA, USDI, NOAA, and the COE) combine efforts to:
 - a) evaluate the ecological risk posed by each environmental problem that each agency regulates;
 - b) identify programs across all natural resource agencies that could be reduced in scope, increased in scope or combined with other programs; and
 - c) redirect resources across agency boundaries (if necessary) to maximize environmental risk reduction.

Recommendations for Future Comparative Risk Evaluations

1. Prior to undertaking the next ecological comparative risk project, at least one person per two programs evaluated needs to be detailed for preparation of specific program reports, obtaining needed databases, evaluating and interpreting data and report preparation. Each individual should be detailed for 120 days. Contract support for computer programming, map preparation and typing should also be available when the risk evaluation effort begins.
2. The Region needs to seek input from state and local natural resource agencies in future years, to access statewide and localized databases, and obtain their input.
3. Databases for groundwater and storage tank problems should be further developed to allow for future evaluation by the mathematical index methodology. Specifically, the areas of impact for each of these problems to non-human populations needs to be identified.

4. The list of problems evaluated needs to be expanded to include oil and gas discharges, water toxic discharges, mining, grazing, highway construction and litter.
5. The impacts to aquatic and terrestrial organism production in the Western Gulf Coastal Plain and Mississippi Alluvial Plain need to receive an increased weighing value. This is necessary because these two ecoregions provide wintering habitat to large concentrations of wildlife which spend major portions of their lives in other ecoregions. Consequently, an impact in these two areas is likely to go beyond ecoregion boundaries.
6. Associated with recommendation 3 is the need to expand the definition of the vulnerability indicators for terrestrial and aquatic organisms to include important keystone or indicator species in addition to endangered species.
7. The mathematical model needs to be re-evaluated to determine whether separate intensity and duration variables are needed. The model also needs to be evaluated to determine whether a reversibility variable needs to be added, or used to replace the vulnerability variable.
8. A decision needs to be made by the next workgroup to determine whether any of the ecological functions should be weighted for purposes of calculating risk index values.
9. The location of unique biological areas or communities needs to be identified through accessing of:
 - a) the National Wetland Inventory, and
 - b) the State heritage program databases.

If possible, these databases should be obtained in a digitized format and entered into the Region's geographic information system.

10. Databases in each of the programs need to be collected or developed on an ecological basis, whether it be by ecoregion or community type, for both aquatic and terrestrial regions or communities.

General Recommendations

1. In past years the Council of Environmental Quality has produced Environmental Trends, a national perspective of the state of the environment. Although the document gives us insightful national trends, it is not specific enough to apply the findings to our agencies programs or regional problems. We recommend that a regional "State of the Environment" report be generated to continue to track the state of our regional environment. This report may or may not be utilized in future ecological risk analysis.
2. Research is needed to identify indicator or keystone species. Research is also needed to investigate the assimilative capabilities of various community types and study the impacts of chemical discharges on whole communities. In this manner, we can preserve the health of ecosystems as well as individual species.

3. Ecological risk can be evaluated at the county level using the existing method by simply changing the area of ecoregion to area of county (A_c) and inputting data for the other variables as currently defined. In this scenario, a matrix score sheet needs to be developed for each county instead of one for each ecoregion. The area of impact will also only reflect area of impact within each county not each ecoregion.
4. Ecological, risk management and health risk values can be combined in future mathematical index models, if desired to create a combined risk index ranking.
5. The risk associated with specific chemicals can also be evaluated and portrayed graphically, through modification of the existing methodology.
6. Results from this risk evaluation can be used for targeting agency enforcement, permitting and grant activities.
7. Large - scale problems, such as pesticides, physical degradation of water and wetlands physical degradation of terrestrial ecosystems, non-point source and groundwater contamination need to be addressed comprehensively through sustainable agriculture initiatives or studies.

IX. REFERENCES

- Arkansas Agricultural Statistics (1988) Arkansas Extension Service, July 1989.
- Birdsey, R.A., May, D.M. (1988) Timber Resources of East Oklahoma, U.S. Department of Agriculture, Southern Forest Experiment Station, New Orleans, LA RB SO-135.
- Conversion Folder, Process Chemical Department, American Cyanamid Company, New York, New York.
- Council on Environmental Quality (1989) Environmental Trends. Washington D.C.
- County and City Data Book (1988). U.S. Department of Commerce, Bureau of the Census.
- County Population Estimates (1986, 1987, 1988) U.S. Department of Commerce, Bureau of the Census, August 1989.
- Dallas Morning News, Texas Almanac (1986-1987).
- Environmental Inventory of 13 Counties with known Coal Resources in New Mexico, Wapora, Inc., Dallas, TX, October 1981.
- Environmental Inventory of 23 Parishes with known Coal Resources in Louisiana, Wapora, Inc., Dallas, TX, October 1981.
- Environmental Inventory of 28 Counties with known Coal Resources in Oklahoma, Wapora, Inc., Dallas, TX, October 1981.
- Environmental Inventory of 38 counties with known Coal Resources in Arkansas, Wapora, Inc., Dallas, TX, October 1981.
- Environmental Inventory of 90 Counties with known Coal Resources in Texas, Wapora, Inc., Dallas, TX, October 1981.
- Environmental Protection Agency (EPA) (1987) Unfinished Business: A Comparative Assessment of Environmental Problems. Appendix III. Ecological Risk Work Group, Office of Policy, Planning and Evaluation. Washington, D.C.
- Federal Information Processing Standards, FIPS State and County Codes.
- Hines, F. Dee (1988) Forest Statistics for Arkansas' Delta Countries, U.S.D.A., S.F.E.S., New Orleans, LA RB SO-133.
- Hines, F. Dee (1988) Forest Statistics for Arkansas' Ouachita Counties, U.S.D.A., S.F.E.S., New Orleans, LA RB-SO-137.
- Hines, F. Dee (1988) Forest Statistics for Arkansas' Ozark Counties, U.S. Department

of Agriculture, Southern Forest Experiment Station, New Orleans, LA, RB SO-131.

Hines, F. Dee (1988) Forest Statistics for Southwest Arkansas Countries, U.S.D.A., S.F.E.S., New Orleans, LA SB SO-140.

Impacts of Lignite Development in Texas, Texas Energy and Natural Resources Advisory Council (Aug. 1983).

Louisiana Agricultural Statistics (1988), Louisiana Agricultural Experiment Station, November, 1989.

Louisiana Almanac (1988-1989) Pelican Publishing Company, Gretna, LA.

McWilliams, W.H., Lord, R.G. (1988) Forest Resources of East Texas, U.S. Department of Agriculture, Southern Forest Experiment Station, New Orleans, LA RB SO-136.

New Mexico Agricultural Statistics (1988), U.S.D.A. in cooperation with the New Mexico Department of Agriculture.

New Mexico Statistical Abstract (1979-1980), Bureau of Business and Economics Research, The University of New Mexico, Albuquerque, New Mexico.

Oklahoma Agricultural Statistics (1988), Oklahoma Department of Agriculture.

Omernick, J. M., Gallant, A. L. (1987) Ecoregions of the South Central States. U.S. Environmental Protection Agency, Washington D.C. USPO 795-479.

Rodale, R., Ecology and Luxury Living May Not Mix. Emmans, Pennsylvania: Rodale Press, 1972.

Rossen, J.F., McWilliams, W.H., Frey, P.D. (1988) Forest Resources of Louisiana. U.S. Department of Agriculture, Southern Forest Experiment Station, New Orleans, LA RB SO-130.

Southwick, Charles, Ecology and the Quality of our Environment. 2nd Edition, New York: D. Van Nostrand Company, 1976.

Statistical Abstract of Oklahoma (1988), Center for Economic and Management Research, College of Business Administration, University of Oklahoma and Oklahoma Department of Commerce, Oklahoma City, Oklahoma.

Texas Agricultural Statistics (1988), U.S.D.A. in cooperation with the Texas Department of Agriculture.

United States Department of Agriculture, Soil Conservation Service (1989) Summary Report 1987 National Resources Inventory, SB-790.

U.S. Fish and Wildlife Service Recovery Program.

Whittaker, Rober H., Communities and Ecosystems. 2nd Edition, New York:
MacMillan Publishing Co., Inc., 1975.

ATTACHMENT A

Revised Core List of Environmental Problem Areas for Regional Comparative Risk Projects

Problem Areas

1. Industrial Wastewater Discharges to Oceans, Lakes, and Rivers

These are sources of pollution that discharge effluents into surface waters through discrete conveyances such as pipes or outfalls. This problem area does not include publicly and privately owned municipal wastewater discharges. Pollutants of concern include total suspended solids; BOD, toxic organics, including phthalates and phenols; toxic inorganics such as heavy metals; and thermal pollution. Typical sources of discharge include metal finishing, pulp and paper processing, and iron and steel production. Facilities requiring permits under the National Pollution Discharges Elimination System (NPDES) fall under this problem area.

2. Municipal Wastewater Discharges to Oceans, Lakes, and Rivers

This problem area includes all constituents of the outfalls of publicly and privately owned treatment facilities. Both municipal sewage treatment outfalls and industrial discharges that flow through publicly operated treatment works are included in this problem area. Major contaminants include all those found under Industrial Wastewater Discharges to Oceans, Lakes and Rivers, plus ammonia, chlorination products, and nutrients. Combined Sewer Overflows (CSO's) are included in this problem area.

3. Aggregated Public and Private Drinking Water Supplies

As drinking water arrives at the tap, it may contain a wide variety of contaminants from both natural and man-made sources, and point and non-point sources. Since many of the contaminants can be traced to other problem areas, Drinking Water risk evaluation will involve much double-counting with those other problem areas (Industrial Wastewater Discharges, POTW Discharges, Non-point Source Discharges, Storage Tanks, hazardous and non-hazardous waste problem areas, etc.). Drinking Water is included as a problem area because remediation/treatment options can occur either at the source of contamination (the other problem areas) or at the delivery system of the drinking water (treatment or switch to alternative supplies). Drinking Water includes both delivery systems that serve 25 or more people and are therefore covered by the Safe Drinking Water Act, and those which serve fewer than 25 people and are not so covered. Pollutants of concern include disinfection byproducts, pesticides, inorganics (such as heavy metals), radionuclides, toxic organics, fluoride from natural sources, and microbiological contaminants.

4. Non-point Source Discharges to Oceans, Lakes, and Rivers

Non-point Source Discharges include pollutants that reach surface waters through sources other than discrete conveyances for effluents. This includes runoff from agricultural, urban, industrial, silvicultural, or undisturbed land. Possible pollutants are quite varied, although they include most of constituents of the point source discharges to surface waters.

Storm water carries a large amount of solids, nutrients, and toxics. Other sources included in this problem area are surface discharge of septic tanks, contaminated in-place sediments, air deposition of pollutants (except for acids), and mine drainage. Pollutants not included in this problem area are acid deposition, solid waste disposal, hazardous waste sites (RCRA & CERCLA), pesticide runoff, and physical impacts from discharges of dredge and fill material.

5. Physical Degradation of Water and Wetland Habitats

Damages arising from alterations in the quantity and flow patterns of ground water and surface water are included in this problem area. Such disturbances include channelization, dam construction and operation, surface and ground water withdrawals, construction and flood control, irrigation distribution works, urban development, and the disposal and runoff of dredge and fill materials. Physical changes to water flow and aquatic habitats are included in this problem area, as is chemical contamination resulting from physical changes (e.g. dredging of contaminated sediments).

6. Aggregated Ground-Water Contamination

All forms of ground water pollution, including sources not counted in other problem areas, compose this problem area. These include fertilizer leaching, septic systems, road salt, all injection wells, nonwaste material stockpiles, pipelines, irrigation practices. The list of possible contaminants is extensive and includes nutrients, toxic inorganics and organics, oil and petroleum products, and microbes. As with drinking water, there is much double-counting in this problem area. It is included as a separate "special" problem area like drinking water because a true understanding of the overall risks to this resource is particularly important, and because such an understanding is difficult if the risks are split between many different problem areas.

7. Storage Tanks

Storage Tanks includes routine or chronic releases of petroleum products or other chemicals from tanks that are above, on or underground, tanks owned by farmers, fuel oil tanks of homeowners, or other storage units (such as barrels).

Stored products include motor fuels, heating oils, solvents and lubricants that have air emissions or can contaminate soil and ground-water with such toxics as benzene, toluene, and xylene. This category excludes hazardous waste tanks. Acute releases (explosions, tanks collapse) are examined under Accidental releases.

8. RCRA Hazardous Waste

This category generally includes the risks posed by active and inactive hazardous waste sites regulated under the Resource Conservation and Recovery Act (RCRA). These sites include RCRA open and closed landfills and surface impoundments, hazardous waste storage tanks, hazardous waste burned in boilers and furnaces, hazardous waste incinerators, and associated solid waste management units. See page and routine releases from these sources contaminate soil, surface water, groundwater, and pollute the air. Contamination resulting from waste

transportation and current illegal disposal are also included. Radiation from hazardous "mixed waste" from RCRA facilities included in this problem area.

9. Hazardous Waste Sites -- Abandoned/Superfund Sites

This category includes hazardous waste sites not covered by RCRA, but by Superfund. Most are inactive and abandoned. Sites can be on the National Priority List (NPL), deleted from the NPL, candidates for the NPL, or simply be noted by the federal government or states as unmanaged locations containing hazardous waste. Sites may contaminate ground or surface water, pollute the air, or directly expose humans and wildlife. There are many pollutants and mixtures of pollutants, including TCE, toluene, heavy metals, and PCB's. Radiation from hazardous "mixed waste" in abandoned/Superfund sites is included in this problem area.

10. Municipal Solid Waste Sites

Municipal waste sites includes open and closed municipal landfills, municipal sludge and refuse incinerators, and municipal surface impoundments. These sources can contaminate ground and surface water and pollute the air with particulates, toxics, BOD, microbes, PCDF's, PBB's, and nutrients. Contamination may occur through routine releases, soil migration or runoff. Most sites are regulated under Subtitle D. This category excludes active and inactive hazardous waste sites.

11. Industrial Solid Waste Sites

Industrial waste sites includes open and closed industrial landfills, industrial sludge and refuse incinerators, and industrial surface impoundments. These sources can contaminate ground and surface water and pollute the air with particulates, toxics, BOD, microbes, PCDF's, PBB's, and nutrients.

Contamination may occur through routine releases, soil migration or runoff. Most sites are regulated under Subtitle D. This category excludes active and inactive hazardous waste sites. Although the list of potential contaminants is similar to municipal solid waste sites, the concentrations, volumes, and mixes of pollutants found on typical sites are frequently very different.

12. Accident Chemical Releases to the Environment

Contaminants are accidentally released into the environment in a variety of ways during transport or production. An industrial unit may explode and emit toxics into the air, a railroad tank car may turn over and spill toxics into surface water or roads, or a ship may run aground and spill oil or other cargo into the environment. Damages to property, personnel, and wildlife may occur from intense, short term releases of toxic or flammable chemicals. Acids, PCB's, ammonia, pesticides, sodium hydroxide, and various petroleum products have been accidentally released.

13. Pesticides

This problem area addresses risks arising from the application, runoff, and residues of pesticides to humans and the environment. It includes risks to people applying agricultural pesticides, including farm workers who mix, load, and apply them. Also included are risks to the public and non-target plants and wildlife as a result of short range drift, overspray, and misuse. Some of the more dangerous substances include ethyl parathion, paraquat, dinoseb, EPN, aldicarb, and diazinon. Disposal of mixed pesticide wastes has resulted in the generation of highly toxic, largely unknown byproducts that have entered the air and caused serious health problems. Suburban spraying of property, often done with high pressure systems, can result in contamination of neighboring property, residents, pets, and livestock. Aside from direct exposure, additional pesticide risks stem from exposure through ingestion of residues on foods eaten by humans and wildlife. Bioaccumulation and food chain effects are also included in this category. Note that accidental releases, groundwater contamination, and indoor air pollution from pesticides are respectively included in Accidental Releases, Aggregated ground water, and Indoor Air problem areas.

14. Sulfur Oxides and Nitrogen Oxides (including Acid Deposition)

Sulfur Oxides and Nitrogen oxides cause a wide variety of primary and secondary effects. Primary effects include health, visibility, and welfare impacts. A major secondary effect is acid deposition, which results from chemical transformation of oxides of sulfur and nitrogen, producing acid rain, snow, and fog, as well as dry deposition. Acid deposition alters the chemistry of affected aquatic and terrestrial ecosystems, damaging plant and animal life.

Sources are a wide variety of industrial, commercial, and residential fuel and related combustion sources. This problem also includes visibility effects resulting from the long range transport of sulfates.

15. Ozone and Carbon Monoxide

Ozone and carbon Monoxide are major air pollutants in many areas, arising from both mobile and stationary sources. Damage to forests, crops, and human health can be severe. Note that volatile organic compounds (VOC's) are critical precursors to ozone formation, but the direct effects of VOC's are included in the Air Toxics problem area. To the extent that VOC's result in ozone, those ozone effects are captured by this problem area.

16. Airborne Lead

Air emissions of lead result from many industrial and commercial processes. This problem area includes both direct exposure to airborne lead and exposure to deposited lead from airborne sources. It does not include exposure to lead from drinking water delivery systems, or lead found in homes and buildings from leaded paint.

17. Particulate Matter

Both total suspended particulates and fine particulates/PM 10 are included in this problem area. Major sources include motor vehicles, residential fuel burning, industrial and commercial processes, and in some cases strip or open pit mining.

18. Hazardous/Toxic Air Pollutants

This problem area covers outdoor exposure to airborne hazardous air pollutants from routine or continuous emissions from point and non-point sources. Pollutants include asbestos, various toxic metal (e.g., chromium, beryllium), organic gases (benzene, chlorinated solvents), polycyclic aromatic hydrocarbons (PAHs, such as benzo(a)pyrene, primarily in particulate form), gasoline vapors, incomplete combustion products, airborne pathogens, cooling towers, and a variety of other volatile organic chemicals and toxics.

The problem area covers exposure through both inhalation and air deposition of these pollutants to land areas. Runoff of deposited pollutants to surface waters is addressed in Non-point Sources. Major sources include large industrial facilities, motor vehicles, chemical plants, commercial solvent users, and combustion sources. This category excludes, to the extent possible, risks from pesticides, airborne lead, radioactive substances, chloroflourocarbons, emissions from waste treatment, storage and disposal facilities; storage tanks, and indoor air toxicants.

19. Indoor Air Pollutants Other Than Radon

This category applies to exposure to accumulated indoor air pollutants, except radon, primarily from sources inside buildings and homes. These sources include unvented space heaters and gas ranges, foam insulation, pesticides, tobacco smoke, asbestos, carbon dioxide, carbon monoxide, nitrogen oxides, lead, pesticides, and numerous volatile organic chemicals such as benzene and formaldehyde. Occupational exposures are included, as is inhalation of contaminants volatilized from drinking water.

20. Indoor Radon

Radon is a radioactive gas produced by the decay of radium, which occurs naturally in almost all soil and rock. Risks occur when radon migrates into buildings through cracks or other openings in the foundation, water, or fuel pipes. The gas is trapped by dense building materials and can accumulate to very high levels. When inhaled, radon decay products can cause lung cancer. This category includes radon volatilized from domestic water use, and also includes occupational exposures. The problem area does not include outdoor radon.

21. Radiation Other Than Radon

Exposure to ionizing and nonionizing radiation (beyond natural background) is included here. Sources of radiation included in this category are: radio frequencies (also T.V. transmitters, power lines, radar, microwave transmissions, and radiation from home appliances and wiring); radiation from nuclear power operations; high-level radioactive waste (including spent reactor

fuel) and low-level waste (including radiopharmaceuticals and laboratory clothing from hospitals involved in nuclear medicine, tools used in cleaning up contaminated areas, etc.); and residual radioactivity (including the decommissioning of facilities such as laboratories and power plants that use radioactive materials. Also included in this category are industrial processes such as uranium mining and milling, and the mining of phosphate.

Radiation resulting from nuclear accidents where radioactivity is released is included under Accidental Releases. Medical exposures (X-rays, radiation therapy) and exposure from ozone depletion are not included.

22. Physical Degradation of Terrestrial Ecosystems/Habitats

Sources affecting terrestrial ecosystems/habitats include both chemical and non-chemical stress agents. Because chemical sources of degradation are addressed in other categories, this category includes physical modifications (such as mining and highway construction) and other sources of degradation (such as dumping of plastics and other litter) that affect terrestrial ecosystems/habitats.

Effects on undisturbed lands/habitats that result from nearby degradation (habitat fragmentation, migration path blockage) are also included in this problem area. EPA often has no regulatory authority over sources of physical degradation, while in other cases it may be able to influence them through the NEPA/EIS process.

ATTACHMENT B

Attachment B

CHARACTERIZATION OF ECOREGIONS IN EPA'S REGION 6

This report is a summary description of 24 ecoregions found in EPA'S Region 6. The definition of ecoregion follows Gallant et al. (1989) and the ecoregion names and boundaries follow Omernik (1987). Alternate local names are sometimes listed in parentheses. An ecoregion is defined as "an area (region) of relative homogeneity in ecological systems." Ecoregions were developed through analysis of patterns of climate, physiography (physical geography), mineral availability, soils, vegetation, and land use. Basic information on these parameters is given for each ecoregion. Information on ecology and wildlife are included for some ecoregions. (Numbers following each section indicate references)

21 Southern Rockies

This region consists of high mountains and tablelands. Mountaintops are above 10,000 feet, with steep slopes in the higher elevations; lower elevations, about 5,000 feet, have rolling to irregular terrain.

Average annual precipitation is 30-60 inches in the higher elevations, where it is cold and humid to arid. The lower elevations are semiarid with 12-16 inches of precipitation. Soils are derived from sedimentary and crystalline rocks.

The natural vegetation at mid-elevations (5,000-10,000 feet) is heavily forested with western spruce, fir, Douglas-fir, pine, and southwestern spruce. Upper elevations (above 10,000 feet) have alpine meadows (bentgrass, sedge, fescue, bluegrass). Lower elevations (less than 5,000 feet) are vegetated with greasewood, saltbush, sagebrush, and grasses.

Land use at the upper elevations is mainly wildlife habitat and recreation; the middle elevations include the same, plus mining and grazing; at lower elevations there is just grazing. (2,8)

22 Arizona/New Mexico Plateau

These are tablelands with considerable to very high relief, with flat to irregular plains with low mountains. The climate is arid to semiarid with annual rainfall from less than 8 inches to 18 inches.

Important grasses include grama and galleta. Great Basin sagebrush, saltbush, greasewood are dominant shrubs.

Land use is subhumid grassland, semiarid grazing land, and desert shrubland grazing land. There is some irrigated agriculture producing grains and vegetables. (2,8)

23 Arizona/ New Mexico Mountains

These are low to high mountains forested with pinyon pine, Douglas-fir, juniper, southwestern spruce, fir, and Arizona pine. Land use is mainly forest and open woodland grazing. (8)

24 Southern Deserts (Trans-Pecos)

The Trans-Pecos is sparsely populated and has little water. The landscape is dominated by dry plains (8-18 inches of rain per year) which are deserts or semi-deserts. Much of this ecoregion is the northern portion of the Chihuahuan Desert which extends deep into Mexico.

The plains are broken by high hills (1,800 to 4,000 feet) and mountains. There are several mountain ranges, such as the Davis and Chisos Mountains with peaks of 5,000 to 8,750 feet. They are either volcanic in origin or fault-block, where the earth's crust has been pushed up. Rainfall is 20 or more inches in the higher elevations.

The eastern part of this region is the Stockton Plateau (the western part of the Edwards Plateau, from Ft. Stockton to the Devil's River). This area is a rough mesquite-juniper brushland of moderate relief.

Soils have developed from outwash materials from the mountains and are varied in surface texture and profile characteristics. Sites are typically stony hills, clay flats, sands, saline soils, gypsum flats, rough stony mountains gravelly outwash and badlands.

The two major rivers of the region are the Pecos and the Rio Grande. Most tributaries are intermittent and subject to flash flooding.

The dominant desert plants include tarbush, creosote, yuccas, agaves, acacia, and cactus. Desert grasslands of grama and tobosa grass are interspersed throughout the shrub desert. In the mountains woodlands consist of oaks, junipers, firs, and pines.

Large mammals found in the mountains are mule deer and mountain lions. Pronghorn (antelope) graze and browse on grass and shrubs of the shortgrass plains between the mountains. Their populations are recovering somewhat after near extirpation. Typical wildlife of the desert include the kangaroo rat, kit fox, cactus wren, and roadrunner. The surprising diversity of the region is illustrated by the number of species found in Big Bend National Park: 10 amphibians, 55 reptiles, 382 birds, and 75 mammals.

Land use is mainly recreation (e.g. Big Bend National Park) or desert shrubland grazing. Much of the area has been overgrazed in the past and has become a creosote-shrub desert.

25 Western High Plains (Llano Estacado, Staked Plains)

The High Plains are smooth to irregular plains; flat, featureless, treeless. Elevation changes from 2,600 to 4,000 feet south to north. The eastern boundary is the Caprock Escarpment. It is only a few hundred feet high, but it is a distinct boundary with canyons cutting back into the plain. The most famous is Palo Duro Canyon. The south and west boundary is the Mescalero Escarpment. The Canadian River Valley, cuts Ecoregion 25 into northern and southern parts.

There is very little natural surface water. Rainfall is 12-20 inches per year.

Soils are derived from Tertiary outwash deposits from the Rockies of New Mexico. Material eroded from the Rocky Mountains washed down and was deposited, creating the region's subsoil, which is a mixture of marl, chalk, gravel, and caliche (a hard, limestone-like material). The rich, sandy loam topsoil was blown onto the plain by southwest winds, probably from the Pecos River valley.

The native vegetation type was short-grass prairie, mainly grama and buffalo grass. Trees along streams include cottonwood, soapberry, and hackberry. Except along creeks, there were no trees until they were brought in by settlers.

Typical wildlife includes jackrabbits, cottontails, prairie dogs, and burrowing owls which live in old prairie dog burrows. Prairie dogs have been poisoned for many years by ranchers and the government and their numbers have been greatly reduced. This has caused the decline of the black-footed ferret which was extirpated from the region in the 1920's. Wolves were also eliminated, but the coyote has thrived, apparently replacing the wolf. Pronghorn are also found on the high plains.

Playa lakes, ephemeral ponds ranging in size from less than an acre to hundreds of acres, are important habitat for wintering and migrating waterfowl, sandhill cranes, and shorebirds. There are over 23,000 Playa lakes in Ecoregions 25 and 26, mostly on the Texas High Plains.

Land use is principally grazing, irrigated agriculture, and dryland farming. Oats, corn, sorghum are common crops. (3,8,9,10,12)

26 Southwestern Tablelands (western part of Rolling Plains)

The topography is mostly hilly, with moderate to considerable relief (50-100 feet). Elevations range from 800 to 3,000 feet southeast to northwest. High plateaus may tower 1,000 feet over river valleys. Most streams are intermittent, and drought is common. Rainfall is between 10-22 inches per year. The main river in the region is the Canadian, whose watershed helps define the region through New Mexico and the Texas Panhandle.

Soils are dry and receive little organic input. They vary from coarse sands (along terraces adjacent to streams) to tight clays or red-bed clays. Soils are neutral to slightly calcareous.

Streams are high in gypsum (calcium sulfate) and salt. There are several chloride control projects in the region to help make the water more palatable.

Dominant native vegetation was a prairie of blue grama, buffalo grass, sandsage, bluestem prairie. With overgrazing, mesquite has invaded and become a dominant. Other important woody species are juniper and lotebush.

Land use: Most of the region is cattle grazing on subhumid to semiarid grassland and semiarid grazing land. There is some irrigated cropland.
(2,7,8,9,10)

27 Central Great Plains (eastern part of Rolling Plains, Reddish Prairies)

These are irregular, gently rolling plains. An important geological feature is the "Red Beds", red sedimentary rock of Permian origin (250 million years ago) that is the parent material for the red clay that is characteristic of much of the region. This gives the streams their reddish color, in particular the Red and Canadian Rivers and tributaries.

Rainfall is between 18 to 30 inches per year.

The native vegetation was bluestem, grama, and buffalo grass. Now large areas, especially around San Angelo, are dominated by mesquite, lotebush, or juniper.

"The basic ecological change on the Rolling Plains [ecoregions 26 and 27] has been from buffalo and grass to beef cattle and mesquite, but also to cotton and other crops,"(8). (6,7,8,9,10)

28 Flint Hills

These are low, open hills. Rainfall is 35-40 inches per year. The native cover type is bluestem prairie (bluestem, panic, indiagrass). Land use is subhumid grassland and semiarid grazing land.
(3,8)

29 Central Oklahoma-Texas Plains (Cross Timbers and Prairies)

These are irregular plains, mostly rolling to hilly. Soils vary considerably from brown, neutral to acid sandy or clay loam, to dark calcareous clays over limestone. Rainfall varies from 26 to 46 inches per year.

This area has diverse vegetation types. The western part is dominated by mesquite-lotebush shrubland. The central part is a mixture of post oak woods and oak-mesquite-juniper woods. The eastern part is dominated by bluestem-wintergrass prairie, liberally interspersed with oak-mesquite-juniper woods. Most of the region is used for grazing, either pasture or woodland. The better soils are in cropland which comprises a small percentage of the region. (4,7,8,10)

30 Central Texas Plateau (Hill Country, eastern part of Edwards Plateau)

These are tablelands with moderate relief, and plains with high hills. The major geological features of this area are the Edwards Plateau and the Llano Uplift (Central Basin). The eastern and southern boundary is the Balcones Escarpment. To the west, it grades into the Stockton Plateau

brushland of Ecoregion 24.

The Edwards Plateau is a huge slab of limestone, rising 1,500 to 3,000 feet above sea level. The limestone is derived from ocean sediment laid down in Cretaceous time in a warm, shallow sea. The Llano Uplift was uplifted by magma in the Precambrian Era that cooled to form granite and other igneous rocks, which is parent material for the soil.

The soil is very poor, thin and rocky. Soils are usually shallow with a wide range of surface textures. Rainfall varies from 20 to 32 inches per year.

Originally the area was mainly grassland. With overgrazing by livestock, woody plants invaded. It is now a scrubby savannah with an overstory of juniper, oak, and mesquite and an understory of Indiangrass, buffalograss, bluestems, and gramas.

Land Use is recreational (hunting, canoeing, hiking, camping) and grazing in the open woodlands, and subhumid and semiarid grasslands. It has an excellent mixture of forage plants, and ranches are often stocked with combinations of cattle, sheep, and goats. The region has some of the best whitetail deer habitat in Texas, and deer leases and services supporting hunting are an important part of the economy. (4,7,8,9,10,13)

31 South Texas Plains (South Texas)

These are smooth to irregular plains. The northern boundary is the Balcones Escarpment, and, roughly, the Nueces River. Soils range from clays to sandy loams. A wide range of soil types creates great differences in soil drainage and moisture-holding capacities. Typical range sites include deep sands, hardlands, shallow ridges, bottomlands, alkali flats and mixed sandy land. Rainfall varies from 20 to 26 inches per year.

This area originally supported a grassland-savannah (bluestem/live oak). Decades of overgrazing has altered the plant community and now there is a severe brush problem caused by mesquite, post oak, live oak, cactus, and acacia. This brushland makes poor grazing, but it does provide habitat for deer, javelina, turkey, quail, coyotes, rabbits, roadrunners, lizards, and snakes. In a few parks and refuges, the Rio Grande Valley east of Falcon Dam supports a remnant of a diverse, essentially Mexican plant and wildlife community not found elsewhere in the U.S.

Most of the area is still range land (subhumid to semiarid grazing land), but considerable acreage is cultivated with irrigation. For example, the Rio Grande Valley produces much of the nation's citrus fruit and vegetables. In Zavala and Dimmit Counties, conditions are ideal for growing spinach and the area has become a major producer of this vegetable. (7,8,9,10)

32 Texas blackland prairies

These are irregular plains, gently rolling to nearly level, 300-800 feet above sea level. Rainfall is between 32 and 40 inches.

The parent materials of the soils are chalk, soft limestone, marl, clay, and shale that was formed from sediment laid down in a shallow sea in the Cretaceous Period (70-135 million years ago). Important formations include the Austin Chalk and the Taylor Marl.

Soils are fairly uniform, dark, calcareous clays with some gray, acid sandy loams. They are mainly vertisols, the shrink-swell clays that develop wide, deep cracks when dry. These are the soils common in Dallas that cause foundation problems.

The native climax prairie vegetation included little bluestem, big bluestem, Indiangrass, switchgrass, and sideoats grama.

Most of this fertile area is now under cultivation, though some ranches remain. (4,7,8,10,13,15,16)

33 East Central Texas Plains (Post Oak Savannah)

These are irregular plains, gently rolling to hilly. Elevations are 300-800 feet above sea level. Rainfall varies between 26 and 44 inches (west to east).

Soils on the uplands are light colored, acid sandy loams or sands. Bottomland soils are light brown to dark gray and acid, ranging in texture from sandy loams to clays. The parent material is sedimentary rock derived from sand, silt, and clay of Quaternary and early Tertiary origin.

This is a transition zone between the true prairies and eastern forests, and is sometimes classified in one or the other category. The cover types include post oak woods and an oak-grassland mosaic. The overstory is mainly oak-hickory and the understory is composed of tall grasses such as little bluestem, Indiangrass, switchgrass. There is evidence that the brush and tree densities have increased tremendously from pre-settlement conditions.

Most of the area is used as native or improved pasture, but small farms are common. (4,7,8,10)

34 Western Gulf Coastal Plain

This includes the Gulf prairies and the coastal marshes, which are flat plains, with elevations from sealevel to 150 feet. Rainfall varies between 26 and 56 inches per year.

Soils on the coastal marsh are acid sands, sandy loams and clays. The upland prairie soils tend to be heavier textured acid clay or clay loams, although there are some sandy loams. In general, soils have slowly permeable profiles. Typical range sites include blackland, sandy prairie, lowland flat, coastal sands, salt meadow and salt marsh.

On the uplands, climax vegetation is a tall grass prairie or post oak savannah. Major grasses include tall bunch grasses such as big bluestem, seacoast bluestem, Indiangrass, and eastern gramagrass. However trees and brush have invaded many areas especially mesquite, oaks, pricklypear, and acacia. In the coastal wetlands, the fresh marsh is dominated by sedges, especially bulrushes (Scirpus spp.), while the salt marshes are mostly cordgrasses (Spartina spp.) and saltgrass (Distichlis). Brackish marshes are mixed.

The coastal marsh is, in Texas, only a relatively narrow strip of less than a million acres of fresh and salt marsh out of over 13 million acres of this ecoregion in Texas. Louisiana (Cameron Parish) has an additional 648,000 acres of coastal marsh (80% of the parish). These wetlands are critical for the diverse and still abundant, but now stressed, fish and wildlife of the region. Nearly all the commercial and sport fish and shellfish of the Gulf of Mexico depend on the bays and intertidal marshes for food and shelter for their early life stages. Wintering waterfowl must have access to the dwindling fresh marshes to see them through until spring. A majority of the bird species of eastern North America are represented at some season on the Texas coast, using either the wetlands or upland prairies and woodlands for wintering grounds, breeding areas, or migratory stopovers.

The land use is mostly cropland with some grazing land. Most of the marsh is grazed by cattle. (4,7,8,9,10,11)

35 South Central Plains (Piney woods)

These are forested, irregular plains. The soil on the uplands are poorly consolidated, light colored to dark gray sands or sandy loams. With rainfall from 44 to 56 inches per year, soils are moist, but poor in nutrients, highly leached, and acid.

The underlying formations are Cretaceous-Eocene deposits (60 - 135 million years old). The boundary with the Paleozoic Ouachitas (Ecoregion 36) to the north is sharp, steep enough to create rapids or waterfalls-i.e. the fall line.

In the extensive bottomlands of Neches, Sabine, Red, and Ouachita River systems the soil is rich alluvium of relatively recent origin (a few thousand years in the lower areas, up to 1 million years on the higher terraces).

This basic cover type is a mixed pine-hardwood forest. Several species of pines, oaks, and hickory predominate. Forests of oak, tupelo-gum, and cypress cover the river bottoms.

The primary land use is still forest land, with pine the principal commercial product. Even-age pine monoculture is the preferred method. Little commercial hardwood remains. Many areas have been cleared for improved pasture. With high rainfall and fertilizer, cattle raising is profitable. (1,3,4,7,8,9,10)

36 Ouachita Mountains

The general landscape is open high hills to open low mountains. They are essentially a series of east-west ridges. The Ouachitas were formed by extensive folding and faulting (tilting and cracking). They are very old, formed in the early to mid-Paleozoic (350 to 500 million years ago). Elevations range from 300-2300 feet. The southernmost part, the Athens Piedmont, is an uplifted plateau, and is rolling to hilly (400-1000 feet high).

The soils are silty clay and silty loam. They are deep in the valleys, but very shallow and stony on the ridges. The parent material is Paleozoic sandstone, shale, and chert.

The basic cover type is a mixed forest of oak, hickory, and pine. An oak, gum, cypress community occurs in river bottoms.

The area is used for grazing and general farming. There are also many recreational opportunities for camping, hiking, and canoeing. (1,3,8)

37 Arkansas Valley

Although this region corresponds closely to the Arkansas River Valley, it is defined geologically as the trough lying between the Ozarks (Boston Mountains) on the north and the Ouachitas on the south. The landscape is mainly rolling hills, interspersed with narrow ridges. The valleys are at 300-500 feet but the ridges rise 1,000-2,000 feet above them.

Surface rocks are mainly sandstone and shale, which is the parent material of the sandy, silty, and clay loam soil.

The vegetation is shortleaf pine-hardwoods on the uplands and bottomland hardwoods on the lower alluvial soils. The land use is cropland with pasture, woodland, and forest. (1,3,8)

38 Boston Mountains

These are low mountains considered to be the southern part of the Ozarks, but are somewhat younger, formed in the late Paleozoic Era (300 million years ago). They are more severely eroded and more rugged than the Ozarks (ecoregion 39). The general elevation ranges from 1,500 to 2,300 feet but local relief can exceed 1,500 feet. Sandstone is exposed on summits. Shale also sometimes occurs at the surface. Soils are sandy loams and clay loams derived from sandstone, siltstone, and shale.

The forests are upland hardwoods, but with more shortleaf pine than the rest of the Ozarks. The only relatively level land is the valleys or the ridge tops which are remnants of the old plateau surface.

Land use is mainly pasture, with some general farming. (1,7,23)

39 Ozark Highlands

The Ozarks are very old dating from the mid-Paleozoic Era, 350 to 500 million years ago. They are plateaus, uplifted as a unit, with minor folding or faulting. The ruggedness developed over the eons from erosion of its rushing streams. Elevation ranges from 500 to 1,500 feet. The boundary with the Arkansas Valley (Ecoregion 37) is sometimes a steep escarpment, sometimes a gentle slope with no sharp change.

Limestone, dolomite, sandstone, shale, and chert comprise the main surface rocks. Soils are mainly silty loam; they are deep in the valleys and flat areas, but very thin on the steeper slopes. The parent material is mainly limestone.

The region's primary vegetation is an upland oak-hickory forest. Land use includes farming, grazing, orchards, vineyards, and forest. (1,8,11)

40 Central irregular plains

These are irregular plains, moderately uneven, with a succession of valley plains and moderately rounded hills. This is the result of erosion on strata of alternating beds of harder (sandstone) and softer (shale) rocks. Erosion has created broad valleys that have gentle west slopes and steep eastern escarpments.

Soils are clay or loam, formed from material weathered from sandstone, limestone, and shale laid down in lowlands and shallow seas of the Pennsylvanian Period (300 million years ago). Quaternary (less than 2 million years old) alluvial sediment is extensive along streams.

The native vegetation is a mosaic of bluestem prairie (bluestem, panic, Indiangrass) and oak/hickory woodland. Land use is cropland with grazing land. (8,18,19,20)

65 Southeastern Plains

These are smooth to irregular plains. The land form is gently sloping terraces leading down to level floodplains, the largest of which is the Pearl River which has extensive bottomlands.

The soils are loamy and formed from either marine or fluvial deposits and are of Recent or Pleistocene age. The main cover type is a southern mixed forest (beech, sweetgum, magnolia, pine, oak, and hickory).

The area is a mosaic of cropland, pasture, woodland, and forest. (8,21)

73 Mississippi Alluvial Plain

The name describes this ecoregion well: it is dominated and defined by the lower Mississippi River floodplain. However, it could be divided into two subregions, the coastal marshes and the inland bottomland forests. Rainfall is 50-60 inches per year.

Marsh soils are high in organic matter and are very productive. The soils in the alluvial plain are by definition derived from sediment deposited by the river. They are deep and flat, and of relatively recent origin (a few thousand years in the lower areas, up to 1 million years on the higher terraces). Sands and silts are deposited closer to the river while clays are deposited in the backwater areas. They are rich and very productive, but subject to flooding.

The coastal marshes cover about 2 million acres of the lower tier of parishes (excluding Cameron Parish, see ecoregion 34). They grade from salt marsh near the Gulf to fresh marsh further inland across a belt 20 -50 miles wide. As in ecoregion 35, these wetlands provide the fish and wildlife habitat that support coastal fisheries, wintering waterfowl, and other wildlife.

In the wettest bottomlands, is the cypress, tupelo-gum swamp. On the higher "second bottoms" is a periodically flooded hardwood forest of oaks, hickories, magnolias, sweetgum, and canebrakes.

Over half of the forested bottomlands in Louisiana and over 85% in Arkansas have been leveed, drained, and cleared for agriculture. Soybeans are particularly suited to this area. (5,11)

74 Mississippi Valley Loess Plains

These are hilly, irregular plains. The soil is loamy, derived from loess, fine-grained, wind deposited material. The average rainfall is 60 inches per year. The cover type is a mixed forest of oak, hickory, and pine. The area is cropland with pasture, woodland, and forest. (14,15,22)

75 Southern Coastal Plain

The area is flat plains (10-50% covered by standing water) dominated by the Pearl River. The cover types are a southern mixed forest (beech, sweetgum magnolia, pine and oak) and a southern floodplain forest (oak, tupelo, baldcypress). The rainfall is 60 inches per year. (8,21)

REFERENCES

1. Arkansas Department of Planning. 1974. Arkansas Natural Area Plan. State of Arkansas, Little Rock. 248 pp.
2. Gallant, A. L., T.R. Whittier, D.P. Larsen, J.M. Omernik, and R.M. Hughes. 1989. Regionalization as a tool for managing environmental resources. U.S. Environmental Protection Agency. Environmental Research Laboratory, Corvallis, Oregon. EPA/600/3-89/060. 152 pp.
3. Geraghty, J.J., D.W. Miller, F. Van der Leeden, and F.L. Troise. No date. Water Atlas of the United States. Water Information Center. Port Washington, New York.
4. Gould, F.W. 1975. Texas Plants, A Checklist and Ecological Summary. The Texas A&M University System, Texas Agricultural Experiment Station, College Station, Texas. 121 pp.
5. Kniffen, F.B. 1968. Louisiana: Its Land and People. Louisiana State University Press, Baton Rouge, La. 196 pp.
6. Larsen, P. 1977. A Sierra Club Naturalist's Guide to Deserts of the Southwest. Sierra Club Books, San Francisco. 286 pp.
7. McMahan, C.A., R.G. Frye, and K.L. Brown. 1984. The Vegetation Types of Texas Including Cropland. Map (scale 1:1,000,000). Texas Parks and Wildlife Department, Wildlife Division. Austin, Texas.
8. Omernik, J.M. and A.L. Gallant. 1987. Ecoregions of the South Central States. Map (scale 1:2,500,000). U.S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, Oregon.
9. Phelan, R. 1976. Texas Wild-The Land, Plants, and Animals of the Lone Star State. Excalibur Books.
10. Texas Department of Water Resources. 1984. Water for Texas: A Comprehensive Plan for the Future. Austin, Texas. 72 pp.
11. Sears, N.E. 1990. Comparative Risk Assessment: Physical Degradation of Water and Wetlands, Ecological and Welfare Risks. Environmental Protection Agency, Region 6, Dallas, Texas.
12. U.S. Fish and Wildlife Service. No date. Playa Lakes: High Plains Oasis. Department of the Interior, Albuquerque, N.M.
13. U.S. Soil Conservation Service, 1979. Soil Survey of Blanco and Burnet Counties, Texas. Department of Agriculture.

14. U.S. Soil Conservation Service, 1980. Soil Survey of Dallas County, Texas. Department of Agriculture.
15. U.S. Soil Conservation Service, 1968. Soil Survey of East Baton Rouge Parish, Louisiana. Department of Agriculture.
16. U.S. Soil Conservation Service, 1978. Soil Survey of Falls County, Texas. Department of Agriculture.
17. U.S. Soil Conservation Service, 1977. Soil Survey of Guadalupe County, Texas. Department of Agriculture.
18. U.S. Soil Conservation Service, 1973. Soil Survey of Mayes County, Oklahoma. Department of Agriculture.
19. U.S. Soil Conservation Service, 1988. Soil Survey of Muskogee County, Oklahoma. Department of Agriculture.
20. U.S. Soil Conservation Service, 1979. Soil Survey of Nowata County, Oklahoma. Department of Agriculture.
21. U.S. Soil Conservation Service, 1990. Soil Survey of St. Tammany Parish, Louisiana. Department of Agriculture.
22. U.S. Soil Conservation Service, 1990. Soil Survey of Tangipahoa Parish, Louisiana. Department of Agriculture.
23. U.S. Soil Conservation Service, 1969. Soil Survey of Washington County, Arkansas. Department of Agriculture.

ATTACHMENT C

Attachment C
EXAMPLE MEMORANDUM

MEMORANDUM

**SUBJECT: Region 6 Ecological Comparative Risk Workgroup
Information Needs**

**FROM: Jerry Saunders
Chairman
Region 6 Ecological Comparative Risk Workgroup (6E-FT)**

TO: Program Offices

As a follow-up to the April 17, 1990 memorandum from Mr. Winkle concerning the request for information from branches for the regional risk project, we need specific information to complete our analysis of ecological risk. In order to complete our analysis the following information is needed from your branch:

1. A listing of RCRA facilities within each state, by city and county.
2. The actual size of each site, or an estimate of the average size of each site.
3. The estimated area around each site that could be impacted by the facility.
4. A determination of which sites are the most damaging to the vegetation, fish and wildlife and why using your best professional judgment. Any general maps or ranking mechanisms you may have would also be very useful for our review.

Please respond or provide this information to us by June 15, 1990. If you should have any questions I can be reached at extension 5-2263. Thank you for your prompt attention to this request.

ATTACHMENT D

Attachment D

DERIVATION OF A_i = AREA OF IMPACT SUBJECT TO RESIDUAL RISK

1. Industrial point source discharge to surface waters

Those areas in each ecoregion that have water quality standard violations for the fish and wildlife propagation standard caused by industrial discharges. The area is measured in stream miles. Data is obtained from the states' annual 305 (b) reports.

2. POTW Discharges to Surface Waters

Those areas in each ecoregion that have water quality standard violations for the fish wildlife propagation standard caused by municipal discharges. The area is measured in stream miles. Data is obtained from the states' annual 305 (b) reports.

3. Drinking Water Public and Private - relates primarily to human health/welfare

4. Non-Point Source Discharges

Those areas in each ecoregion with water quality problems caused by non-point source discharges. The area is measured in stream miles. Data is obtained from the states' annual 305 (b) reports or nonpoint source assessments.

5. Hydrologic Disruptions

Those areas in each ecoregion that are wetlands. The area is measured in acres.

6. Other Groundwater Contamination

Those areas in each ecoregion with known ground water contamination, which may impact non-human populations (generally areas of Karst geology and shallow alluvial aquifers). Area data was not available for this report.

7. Storage Tanks

Those areas in each ecoregion with known storage tank problems which may impact non-human populations. Area for each ecoregion was not available for this report. The area is measured in acres.

8. RCRA Hazardous Waste Sites

Those areas in each ecoregion that have been evaluated and assigned an Environmental Priority Initiative ranking. The estimated average area of onsite impact was determined by the program to be fifty acres per site. The offsite impact is estimated to be a three mile radius around the site.

9. CERCLA Sites

Those sites in each ecoregion that are on the National Priority Listing (NPL). The area of impact for each facility was provided by the program. The area is measured in acres. The onsite impact area is the actual size of the site. The offsite impact is estimated to be a one mile radius around the site.

10. Other Waste Sites - Municipal

Those actual landfills and open dumps in each ecoregion that pose a threat to non-human populations. The area is estimated in acres.

11. Other Waste Sites - Industrial

The area of oil and gas waste pits in each ecoregion. Other industrial waste sites may be added.

12. Accidental Releases

The area in each ecoregion impacted by accidental releases. A fifty year time period was used to determine residual risk. The area is measured in acres.

13. Application of Pesticides

Those areas in each ecoregion subject to pesticide and herbicide application, measured in acres.

14. Acid Deposition

There were no non-attainment areas for sulfur dioxide or nitric oxides in the Region.

15. Ozone and Carbon Monoxide

Those areas in each ecoregion violating standards for ozone and carbon monoxide. The area is measured in acres.

16. Airborne Lead

Those areas in each ecoregion violating standards for airborne lead. The area is measured in acres.

17. Particulate Matter

Those areas in each ecoregion violating standards for particulate matter. The area is measured in acres.

18. Hazardous/Toxic Air Pollutants

Those areas in each ecoregion with potential toxic air pollutant impacts on non-human populations. A four mile radius around each discharge was assumed to be the potential area of impact.

19. Indoor Air Pollutants - relates primarily to human populations.

20. Indoor Radon - relates primarily to human populations.

21. Radiation other than radon - available data indicates negligible impact in this Region.

22. Physical degradation of Terrestrial Ecosystem/Habitats

Those areas subject to urbanization, agricultural activities/ conversion, and silvicultural activities/conversion. The area were measured in acres.

ATTACHMENT E

ATTACHMENT E

Derivation of D_I = Degree of Impact

The degree of impact variable represents the characteristics of each problem and its impact. To determine degree of impact the question is asked what is the general impact of each problem on each ecological function? (Ecological functions include mechanisms for distributing water and nutrients, oxygen production, filtering and detoxifying of pollutants, soil production, aquatic organism production and terrestrial organism production). There are six generic relative levels of impact from which to choose, as described below:

- Level 1 - Problem (discharge or activity) causes violation of an environmental standard which protects an ecological function. *
- Level 2 - Problem (discharge or activity) causing observable impairment or exists at a concentration known to impair the ecological function.
- Level 3 - Problem (discharge or activity) causes elimination of ecological function but duration of impact lasts less than five years.
- Level 4 - Problem (discharge or activity) causes elimination of ecological function and duration of impact lasts greater than five years but less than fifty years.
- Level 5 - Problem (discharge or activity) causes elimination of the ecological function and duration of impact lasts greater than fifty years.
- Level 6 - Problem (discharge or activity) causes elimination of the landscape or modification of ecoregion boundaries.

* If no standards exist, then level 1 impact is assumed to exist because an acceptable level of impact has not been defined.

Definition of each ecological function and specific evaluation criteria for determining the degree of impact for each ecological function are described in the following narratives.

- A. **HYDROLOGY**- The mechanism for distributing water and nutrients across the surface of the landscape, deals only with surface and groundwater available to non-human populations within an ecoregion.

- Degree of Impact Criteria:
- 1 - Problem results in minor disruption in surface or groundwater distribution system.
 - 2 - Problem results in disruption of hydrologic system for less than a year.

- 3 - Problem results in temporary elimination (less than five years) of portions of the surface or groundwater distribution system.
- 4 - Problem results in temporary elimination (greater than five years but less than fifty years) of portions of the surface or groundwater distribution system.
- 5 - Problem results in elimination (for greater than fifty years) of portions of the surface or groundwater distribution system.
- 6 - Problem results in elimination of the landscape or modification of the ecoregion boundaries.

B. OXYGEN PRODUCTION/CARBON DIOXIDE CONSUMPTION - The production of oxygen and consumption of carbon dioxide by plants. Evaluation criteria have not been developed for this function.

C. FILTERING/DETOXIFYING OF POLLUTANTS - The ability of the ecoregion to remove or make harmless contaminants, excess nutrients, or particulate matter from air, water or soils. The assimilative capacity of an ecoregion is determined by soils, topography, micro-organism populations, vegetative uptake, stream flow and wind velocities.

- Degree of Impact Criteria:
- 1 - Problem reduces assimilative capacity of natural system through destruction of vegetation and micro-organism populations.
 - 2 - Problem exceeds the assimilative capacity of the natural system for less than a year.
 - 3 - Problem exceeds the assimilative capacity of the natural system (problem lasts greater than a year but less than five years).
 - 4 - Problem continually exceeds the assimilative capacity of a natural system. Problem lasts greater than five years but less than fifty years.
 - 5 - Problem continually exceeds the assimilative capacity of the natural system (for greater than fifty years).

D. SOIL PRODUCTION - This is the ability of an ecoregion to maintain a dynamic soil environment. In a healthy soil environment weathering of sediments/lithologies, growth of soil macro- and micro-biota, and the degradation of organic material continue at a rate where inputs are balanced against outputs. When soils are stressed by environmental

effects, organic matter may be lost, biota is stressed or eliminated and weathering rates and products are effected. A stressed soil will have a reduced capacity to produce normal soil gases, and act as a filter against contamination of groundwater. Since the stressed soil also has a reduced ability to remain in place and is subject to erosive forces, soil loss rate as determined by the Soil Conservation Service's Universal Soil Loss Equation or Rainfall Erosion Index are useful indicators of the health of the soil. The indicator of impact to soil production is soil erosion.

- Degree of Impact Criteria:
- 1 - Problem could cause soil loss problem.
 - 2 - Problem causes observable or measurable soil loss.
 - 3 - Problem causes modest soil loss rates without loss of productive top soil.
 - 4 - Problem causes high top soil loss rates.
 - 5 - Problem causes very high soil loss rates with loss of productive top soil and subsoils.

E. AQUATIC LIFE PRODUCTION - The ability of an ecosystem to maintain diverse and stable communities of aquatic organisms. The indicators of impact are aquatic habitat or aquatic organism populations.

- Degree of Impact Criteria:
- 1 - Problem causes violation of water quality standard.
 - 2 - Problem causes observable impact to aquatic organisms or exists at a concentration known to impair aquatic organism production.
 - 3 - Problem causes temporary elimination of aquatic populations but damage lasts less than five years.
 - 4 - Problem causes elimination of aquatic populations, and damage lasts greater than five years but less than fifty years.
 - 5 - Problem eliminates aquatic populations and damage for greater than fifty years.

- F. TERRESTRIAL ORGANISM PRODUCTION - The ability of an ecosystem to maintain diverse and stable communities of terrestrial organisms. The indicators of impact are terrestrial habitat or terrestrial organism populations.

Degree of Impact Criteria:

- 1 - Problem has potential to impact terrestrial organism populations.
- 2 - Problem causes observable impact to terrestrial organisms or exists at a concentration known to impair terrestrial populations.
- 3 - Problem causes temporary elimination of terrestrial populations for less than five years.
- 4 - Problem causes elimination of terrestrial populations for greater than five but less than fifty years.
- 5 - Problem eliminates terrestrial populations for greater than fifty years.
- 6 - Problem permanently eliminates terrestrial organisms due to land loss or modification of ecoregional boundaries.

- G. PRIMARY PRODUCTION - The conversion of sunlight into organic matter which is available to non-human populations. The indicator of impact to primary production is vegetative populations which generally produce food for non-human populations.

Degree of Impact Criteria:

- 1 - Problem has potential to impact vegetative populations.
- 2 - Problem causes impairment of vegetative growth or physical damage to plants.
- 3 - Problem temporarily eliminates vegetative populations for less than five years.
- 4 - Problem eliminates vegetative populations from five to fifty years.
- 5 - Problem eliminates vegetative populations for greater than fifty years.

ATTACHMENT F

Attachment F

Derivation of D_v = Degree of Vulnerability

The degree of vulnerability variable represents the characteristics of each ecoregion, which allow each ecoregion to react differently to the stress posed by each of the twenty two identified problems. These characteristics, some for each of the seven functions collectively determine an ecoregion's vulnerability to any one problem. Features that make an ecoregion vulnerable include the number of endangered species, stream density per ecoregion, the existing soil loss rate, existing rates of primary productivity and physical characteristics that affect filtering and detoxifying of pollutants. The following narrative descriptions further define the range of vulnerability for each of the seven ecosystem functions: terrestrial organism production, aquatic organism production, soil production, oxygen production, primary productivity, hydrology, and filtering and detoxifying of pollutants. The range for purposes of assigning a numeric value varies from 1-5.

A. Degrees of Vulnerability for Hydrology

The hydrology function for each ecoregion is determined by the distribution of surface and groundwater hydrology, which is available to non-human populations. Degrees of vulnerability may be defined as follows:

- 1 - Ecoregion is characterized by a high stream density of ≥ 0.25 stream miles per square mile of drainage area.
- 2 - Ecoregion is characterized by a stream density of 0.22 to 0.24 stream miles per square mile of drainage area.
- 3 - Ecoregion is characterized by a moderate stream density of 0.19 to 0.21 stream miles per square mile of drainage area.
- 4 - Ecoregion is characterized by a stream density of 0.14 to 0.17 stream miles per square mile of drainage area.
- 5 - Ecoregion is characterized by a low stream density of 0.09 to 0.13 stream miles per square mile of drainage area.

B. Degree of Vulnerability for Oxygen Production/Carbon Dioxide Consumption

Criteria for determining degrees of vulnerability for oxygen production and carbon dioxide consumption have not been developed.

C. Degrees of Vulnerability for Filtering and Detoxifying of Pollutants.

The assimilative capacity function is routinely performed by vegetation, microorganisms, soil complexes and dilution in various media. Each ecoregion possesses characteristics that influence its ability to filter and detoxify pollutants. General descriptions of the degrees

of vulnerability are as follows:

- 1 - Ecoregion characterized by a mean annual morning wind velocity of >7 meters per second and high annual stream flows.
- 2 - Ecoregion characterized by a mean annual morning wind velocity of 6 to 7 meters per second and moderate to high stream flows.
- 3 - Ecoregion characterized by a mean annual morning wind velocity of 5 to 6 meters per second and moderate stream flows.
- 4 - Ecoregion characterized by a mean annual morning wind velocity of 4 to 5 meters per second and low to moderate stream flows.
- 5 - Ecoregion characterized by a mean annual morning wind velocity of 3 to 4 meters per second and low stream flows.

D. Degrees of Vulnerability for Soil Production

On a regional level, the rainfall erosion index is useful in identifying areas which are susceptible to erosion. The degrees of vulnerability which we used are as follows:

- 1 - Ecoregion characterized by a rainfall erosion index of 0 to 100.
- 2 - Ecoregion characterized by a rainfall erosion index of > 100 to 200.
- 3 - Ecoregion characterized by a rainfall erosion index of > 200 to 300.
- 4 - Ecoregion characterized by a rainfall erosion index of > 300 to 400.
- 5 - Ecoregion characterized by a rainfall erosion index of > 400 to 500.

E. Degrees of Vulnerability for Aquatic Life Production.

The production of aquatic organism varies from one water body to the next and water quality standards for aquatic organisms propagation varies from one state to the next. However, degrees of vulnerability may generally be defined as follows:

- 1 - Ecoregion is characterized by 0.0-0.29 average number of endangered species per county.
- 2 - Ecoregion is characterized by 0.3-0.49 average number of endangered species per county.
- 3 - Ecoregion is characterized by 0.5-0.99 average number of endangered species per county.
- 4 - Ecoregion is characterized by 1.0-1.99 average number of endangered species per county.
- 5 - Ecoregion is characterized by more than two endangered species per county.

F. Degrees of Vulnerability for Terrestrial Organism Populations

For the ecological function, terrestrial organism production, it is assumed that vulnerability can be defined as the presence or absence of Federally endangered or threatened species. An endangered species is one that is in danger of becoming extinct through all or a significant portion of its natural range. A threatened species is one that is likely to become endangered in the foreseeable future.

The degrees of vulnerability which were used for the terrestrial organism function are defined as follows:

- 1 - Ecoregion is characterized by an average of 0 to 1 endangered species per county.
- 2 - Ecoregion is characterized by an average of 1 to 1.9 endangered species per county.
- 3 - Ecoregion is characterized by an average of 2 to 2.9 endangered species per county.
- 4 - Ecoregion is characterized by an average of 3 to 3.9 endangered species per county.
- 5 - Ecoregion is characterized by an average of 4 or greater endangered species per county.

G. Degrees of Vulnerability for Primary Productivity

The primary productivity function reflects the rate of carbon fixation by vegetation. Some ecoregions have very high growth (or recovery) rates while other ecoregions have very low growth (or recovery) rates. To help develop a ranking system we have extracted information from Whitaker (1975) to determine the range of primary productivity and define numeric values. The degrees of vulnerability for primary productivity are defined as follows:

- 1 - Predominant natural vegetative cover type for ecoregion is characterized by mean net primary productivity rate of > 1600 to 2000 grams per square meter per year.
- 2 - Predominant natural vegetative cover type for ecoregion is characterized by mean net primary productivity rate of > 1200 to 1600 grams per square meter per year.
- 3 - Predominant natural vegetative cover type for ecoregion is characterized by mean net primary productivity rate of > 800 to 1200 grams per square meter per year.
- 4 - Predominant natural vegetative cover type for ecoregion is characterized by mean net primary productivity rate of > 400 to 800 grams per square meter per year.
- 5 - Predominant natural vegetative cover type for ecoregion is characterized by mean net primary productivity rate of 0 to 400 grams per square meter per year.

MAP LEGEND

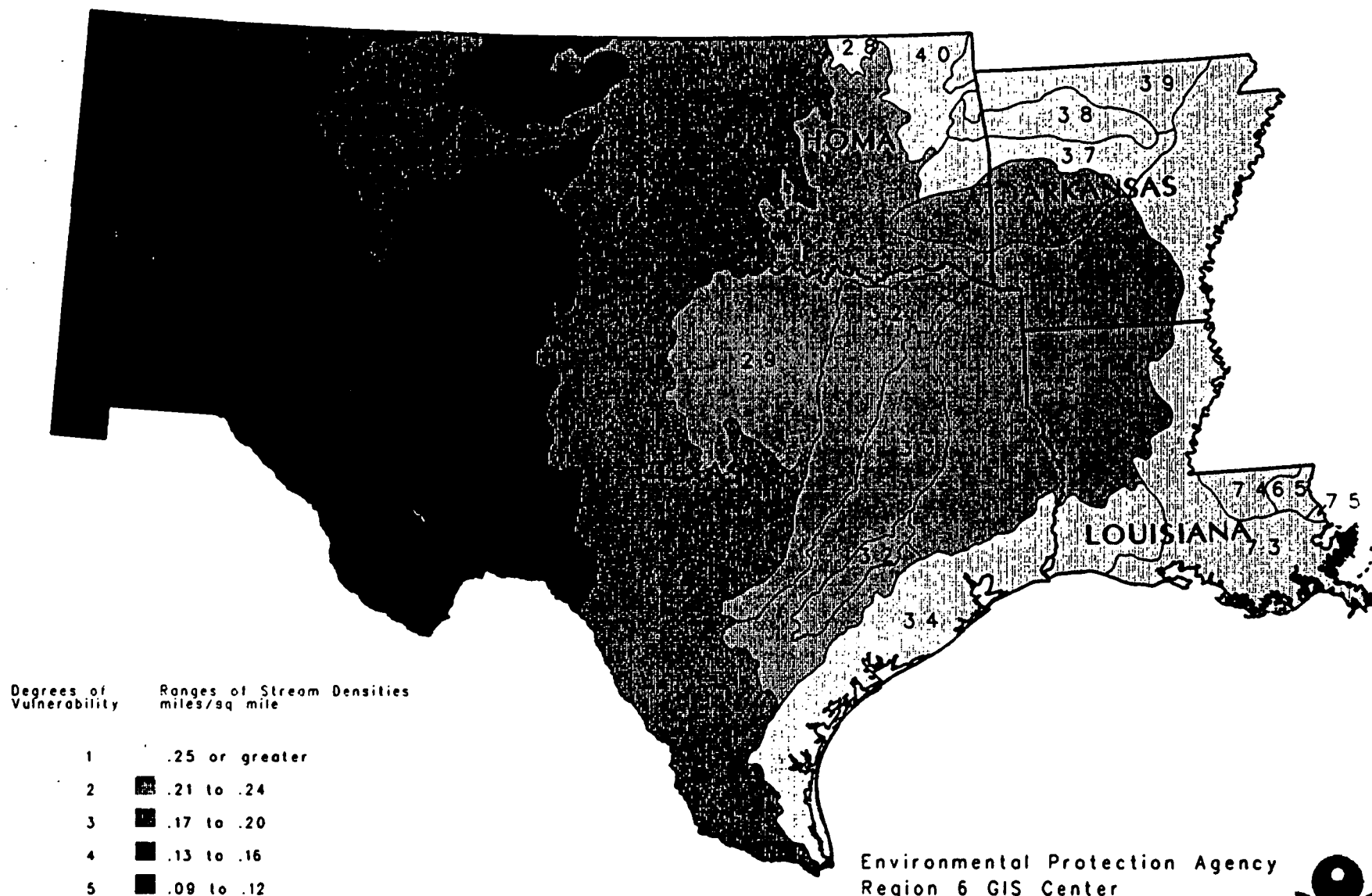
- | | |
|------------------------------------|---|
| 21) Southern Rockies, NM | 33) East Central Texas Plains |
| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 18

Relative Ranking of Stream Density per Ecoregion

Ranges of Stream Densities



Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



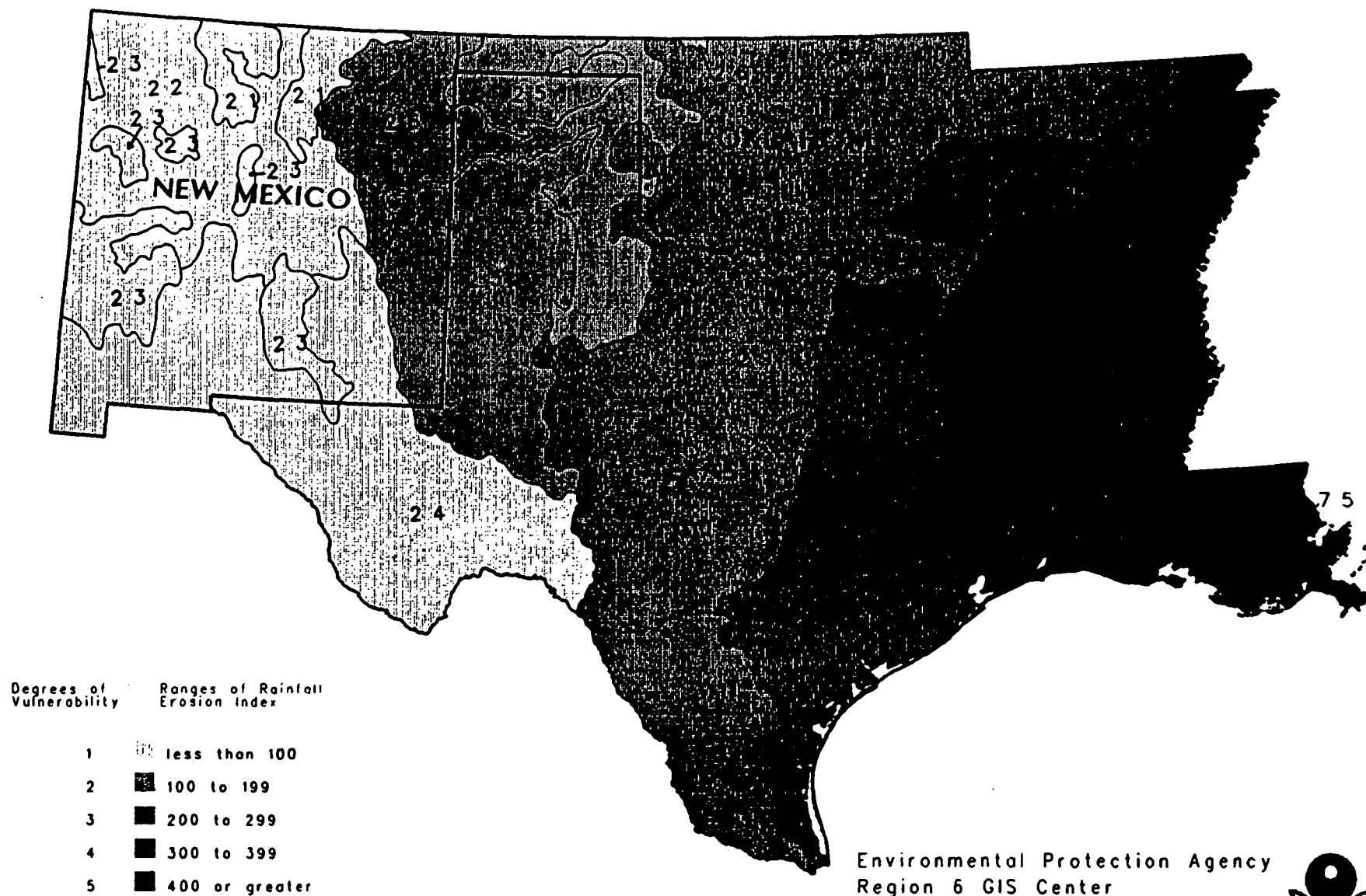
MAP LEGEND

- | | |
|------------------------------------|---|
| 21) Southern Rockies, NM | 33) East Central Texas Plains |
| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

Soil Production - Vulnerability

Relative Ranking of Rainfall Erosion Per Ecoregion



Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



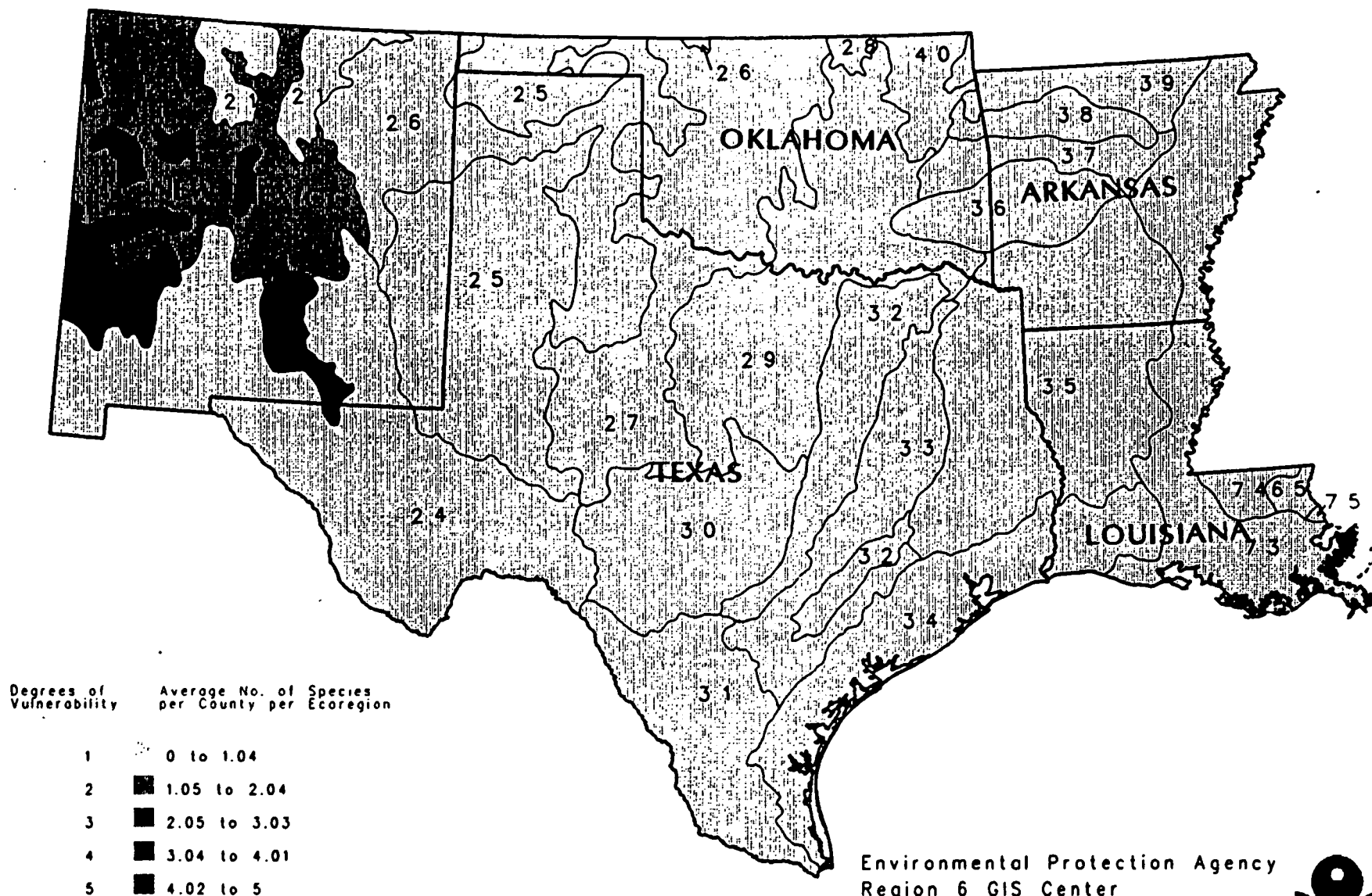
MAP LEGEND

- | | |
|------------------------------------|---|
| 21) Southern Rockies, NM | 33) East Central Texas Plains |
| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 20

Aquatic Organism Production-Vulnerability



Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



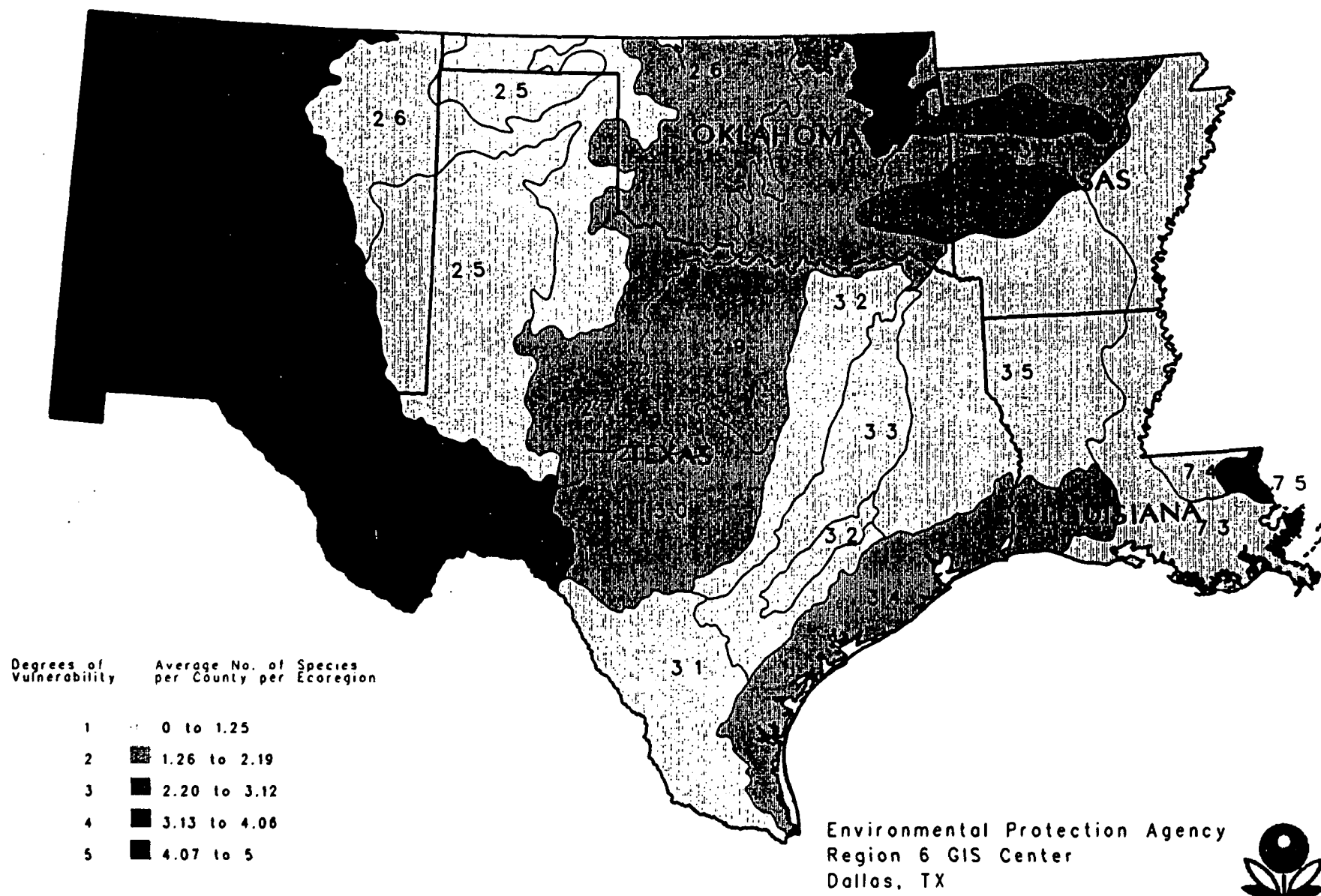
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|------------------------------------|---|
| 21) Southern Rockies, NM | 33) East Central Texas Plains |
| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

MAP 21

Terrestrial Organism Production-Vulnerability



Source: U.S. Fish and Wildlife Service

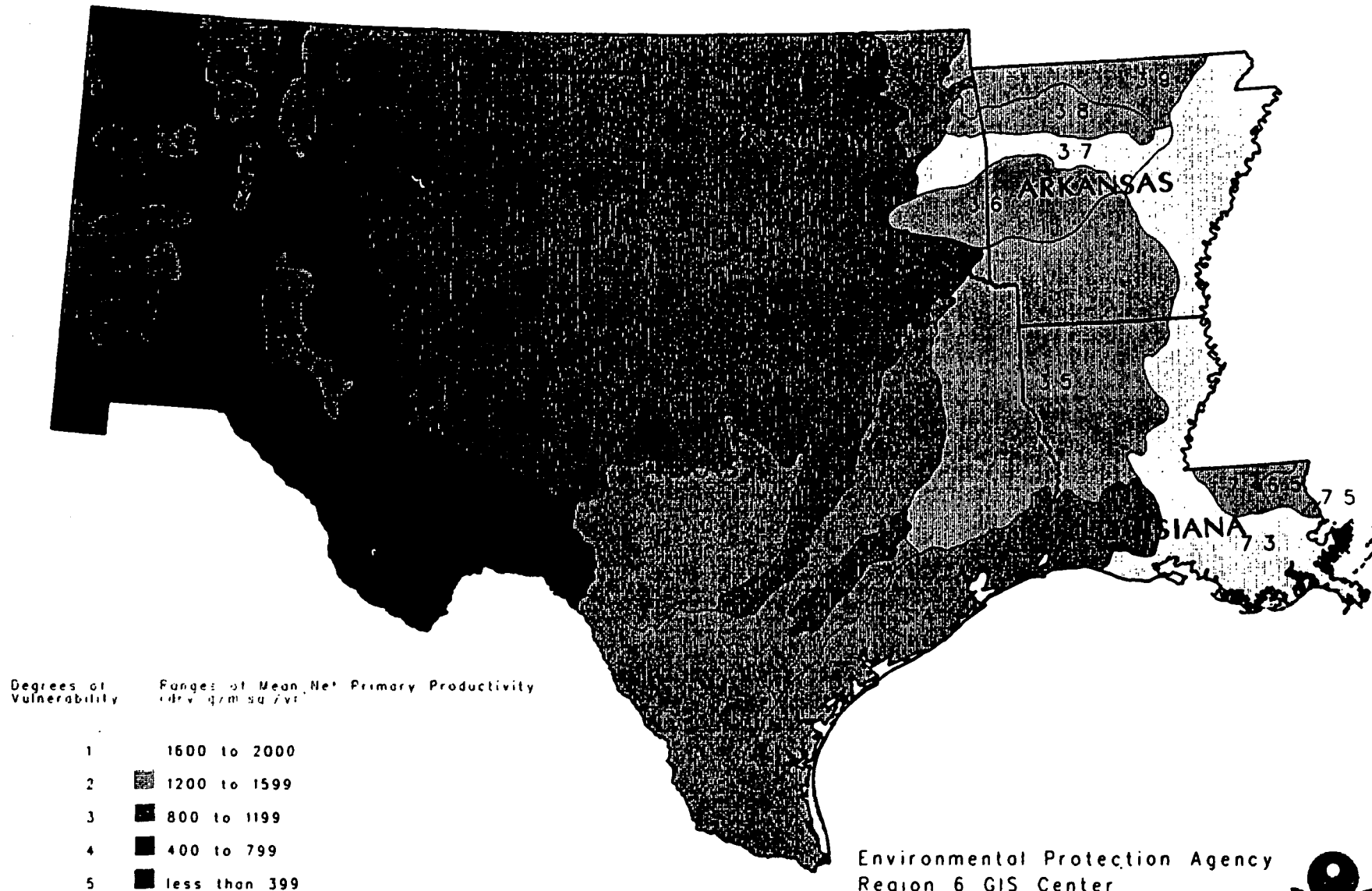
MAP LEGEND

- | | |
|------------------------------------|---|
| 21) Southern Rockies, NM | 33) East Central Texas Plains |
| 22) Arizona/New Mexico Plateau | 34) Western Gulf Coastal Plains, LA/TX |
| 23) Arizona/New Mexico Mountains | 35) South Central Plain, AR/LA/TX |
| 24) Southern Deserts, NM/TX | 36) Ouachita Mountains, AR/OK |
| 25) Western High Plains, NM/TX | 37) Arkansas Valley, AR/OK |
| 26) Southwestern Tablelands, OK/TX | 38) Boston Mountains, AR/OK |
| 27) Central Great Plains, OK/TX | 39) Ozark Highlands, AR/OK |
| 28) Flint Hills, OK | 40) Central Irregular Plains, OK |
| 29) Central Oklahoma/Texas Plains | 65) Southeastern Plains, LA |
| 30) Central Texas Plateau | 73) Mississippi Alluvial Plains, AR/LA |
| 31) Southern Texas Plains | 74) Mississippi Valley Loess Plains, LA |
| 32) Texas Blackland Prairies | 75) Southern Coastal Plains, LA |

For further Description of each Ecoregion refer to ATTACHMENT B.

Primary Production Vulnerability

Mean Net Primary Productivity per Ecoregion



Environmental Protection Agency
Region 6 GIS Center
Dallas, TX



ATTACHMENT G

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ATTACHMENT G

Data Management Techniques

In order to deal with the vast amount of data involved in the ecological risk model, Region 6 has developed an Ecological Risk Management System. This system is based on a PC/DOS platform using the application software dBase III+. Since special characters and fonts were used to print out the analyses and because of time constraints, the system was developed for two types of printers: the Hewlett Packard Laser, and the Citizen MSP-15. In its present state, the system uses approximately 2.6 KB of disk space (1.8K is for data, and 0.8K is for the system programs). The system has several features which include:

- 1) limited user interface (menu driven),
- 2) Data update procedures for inputing and modifying Ecoregion, Environmental Problem, Environmental Function, Impact Site, Vulnerability, and Data Quality data,
- 3) Risk Index Matrix calculations and output procedures,
- 4) Risk Vulnerability reports, and
- 5) Data Set listings.

The features that we hope to implement in the future include:

- 1) Data Quality analysis,
- 2) Automated conversions for unit data (square miles to acres...),
- 3) Export/Import routines (Importing program data and exporting to Arcinfo GIS for map production),
- 4) Sensitivity analysis,
- 5) Extended printer options,
- 6) Improvements in computational and output speeds, and
- 7) Developing and implementing risk models for the Human and Economic concerns.

ATTACHMENT H

Accidental Releases

Record#	ec	func	prob	imp	vul	scode	spval	units	substr(sitedesc,1,40)	staff
1	31	1	12	0	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
2	31	2	12	0	0	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
3	31	3	12	1	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
4	31	4	12	1	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
5	31	5	12	1	1	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
6	31	6	12	1	1	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
7	31	7	12	0	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
8	31	1	12	0	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
9	31	2	12	0	0	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
10	31	3	12	1	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
11	31	4	12	1	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
12	31	5	12	1	1	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
13	31	6	12	1	1	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
14	31	7	12	0	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
15	31	1	12	0	3	AU	1920.00	ACRES	SOUTHERN TEXAS PLAINS	
16	31	2	12	0	0	AU	1920.00	ACRES	SOUTHERN TEXAS PLAINS	
17	31	3	12	1	3	AU	1920.00	ACRES	SOUTHERN TEXAS PLAINS	
18	31	4	12	1	3	AU	1920.00	ACRES	SOUTHERN TEXAS PLAINS	
19	31	5	12	1	1	AU	1920.00	ACRES	SOUTHERN TEXAS PLAINS	
20	31	6	12	1	1	AU	1920.00	ACRES	SOUTHERN TEXAS PLAINS	
21	31	7	12	0	3	AU	1920.00	ACRES	SOUTHERN TEXAS PLAINS	
22	31	1	12	0	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
23	31	2	12	0	0	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
24	31	3	12	1	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
25	31	4	12	1	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
26	31	5	12	1	1	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
27	31	6	12	1	1	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
28	31	7	12	0	3	AU	320.00	ACRES	SOUTHERN TEXAS PLAINS	
29	31	1	12	0	3	AU	640.00	ACRES	SOUTHERN TEXAS PLAINS	
30	31	2	12	0	0	AU	640.00	ACRES	SOUTHERN TEXAS PLAINS	
31	31	3	12	1	3	AU	640.00	ACRES	SOUTHERN TEXAS PLAINS	
32	31	4	12	1	3	AU	640.00	ACRES	SOUTHERN TEXAS PLAINS	
33	31	5	12	1	1	AU	640.00	ACRES	SOUTHERN TEXAS PLAINS	
34	31	6	12	1	1	AU	640.00	ACRES	SOUTHERN TEXAS PLAINS	
35	31	7	12	0	3	AU	640.00	ACRES	SOUTHERN TEXAS PLAINS	
36	33	1	12	0	2	AU	640.00	ACRES	EAST CENTRAL PLAINS	
37	33	2	12	0	0	AU	640.00	ACRES	EAST CENTRAL PLAINS	
38	33	3	12	1	2	AU	640.00	ACRES	EAST CENTRAL PLAINS	
39	33	4	12	1	4	AU	640.00	ACRES	EAST CENTRAL PLAINS	
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42	33	7	12	0	3	AU	640.00	ACRES	EAST CENTRAL PLAINS	
43	33	1	12	0	2	AU	160.00	ACRES	EAST CENTRAL PLAINS	
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46	33	4	12	1	4	AU	160.00	ACRES	EAST CENTRAL PLAINS	
47	33	5	12	1	1	AU	160.00	ACRES	EAST CENTRAL PLAINS	
48	33	6	12	1	2	AU	160.00	ACRES	EAST CENTRAL PLAINS	
49	33	7	12	0	3	AU	160.00	ACRES	EAST CENTRAL PLAINS	
50	33	1	12	0	2	AU	640.00	ACRES	EAST CENTRAL PLAINS	
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54	33	5	12	1	1	AU	640.00	ACRES	EAST CENTRAL PLAINS	
55	33	6	12	1	2	AU	640.00	ACRES	EAST CENTRAL PLAINS	
56	33	7	12	0	3	AU	640.00	ACRES	EAST CENTRAL PLAINS	
57	33	1	12	0	2	AU	640.00	ACRES	EAST CENTRAL PLAINS	
58	33	2	12	0	0	AU	640.00	ACRES	EAST CENTRAL PLAINS	
59	33	3	12	1	2	AU	640.00	ACRES	EAST CENTRAL PLAINS	
60	33	4	12	1	4	AU	640.00	ACRES	EAST CENTRAL PLAINS	
61	33	5	12	1	1	AU	640.00	ACRES	EAST CENTRAL PLAINS	
62	33	6	12	1	2	AU	640.00	ACRES	EAST CENTRAL PLAINS	
63	33	7	12	0	3	AU	640.00	ACRES	EAST CENTRAL PLAINS	

Accidental Releases

64	33	1	12	0	2 AU	1280.00 ACRES	EAST CENTRAL PLAINS
65	33	2	12	0	0 AU	1280.00 ACRES	EAST CENTRAL PLAINS
66	33	3	12	2	2 AU	1280.00 ACRES	EAST CENTRAL PLAINS
67	33	4	12	2	4 AU	1280.00 ACRES	EAST CENTRAL PLAINS
68	33	5	12	2	1 AU	1280.00 ACRES	EAST CENTRAL PLAINS
69	33	6	12	2	2 AU	1280.00 ACRES	EAST CENTRAL PLAINS
70	33	7	12	0	3 AU	1280.00 ACRES	EAST CENTRAL PLAINS
71	32	1	12	0	2 AU	320.00 ACRES	TEXAS BLACKLAND PRAISIES
72	32	2	12	0	0 AU	320.00 ACRES	TEXAS BLACKLAND PRAISIES
73	32	3	12	1	5 AU	320.00 ACRES	TEXAS BLACKLAND PRAISIES
74	32	4	12	1	4 AU	320.00 ACRES	TEXAS BLACKLAND PRAISIES
75	32	5	12	1	1 AU	320.00 ACRES	TEXAS BLACKLAND PRAISIES
76	32	6	12	1	2 AU	320.00 ACRES	TEXAS BLACKLAND PRAISIES
77	32	7	12	0	4 AU	320.00 ACRES	TEXAS BLACKLAND PRAISIES
78	32	1	12	0	2 AU	640.00 ACRES	TEXAS BLACKLAND PRAISIES
79	32	2	12	0	0 AU	640.00 ACRES	TEXAS BLACKLAND PRAISIES
80	32	3	12	1	5 AU	640.00 ACRES	TEXAS BLACKLAND PRAISIES
81	32	4	12	1	4 AU	640.00 ACRES	TEXAS BLACKLAND PRAISIES
82	32	5	12	1	1 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
83	32	6	12	1	2 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
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85	32	1	12	0	2 AU	1920.00 ACRES	TEXAS BLACKLAND PRAIRIES
86	32	2	12	0	0 AU	1920.00 ACRES	TEXAS BLACKLAND PRAIRIES
87	32	3	12	1	5 AU	1920.00 ACRES	TEXAS BLACKLAND PRAIRIES
88	32	4	12	1	4 AU	1920.00 ACRES	TEXAS BLACKLAND PRAIRIES
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91	32	7	12	0	4 AU	1920.00 ACRES	TEXAS BLACKLAND PRAIRIES
92	32	1	12	0	2 AU	6400.00 ACRES	TEXAS BLACKLAND PRAIRIES
93	32	2	12	0	0 AU	6400.00 ACRES	TEXAS BLACKLAND PRAIRIES
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95	32	4	12	1	4 AU	6400.00 ACRES	TEXAS BLACKLAND PRAIRIES
96	32	5	12	1	1 AU	6400.00 ACRES	TEXAS BLACKLAND PRAISIES
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98	32	7	12	0	4 AU	6400.00 ACRES	TEXAS BLACKLAND PRAIRIES
99	32	1	12	0	2 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
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104	32	6	12	1	2 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
105	32	7	12	0	4 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
106	32	1	12	0	2 AU	3200.00 ACRES	TEXAS BLACKLAND PRAIRIES
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110	32	5	12	1	1 AU	3200.00 ACRES	TEXAS BLACKLAND PRAIRIES
111	32	6	12	1	2 AU	3200.00 ACRES	TEXAS BLACKLAND PRAIRIES
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114	32	2	12	0	0 AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
115	32	3	12	1	5 AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
116	32	4	12	2	4 AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
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118	32	6	12	2	2 AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
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120	32	1	12	0	2 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
121	32	2	12	0	0 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
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123	32	4	12	1	4 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
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126	32	7	12	0	4 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
127	32	1	12	0	2 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
128	32	2	12	0	0 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
129	32	3	12	1	5 AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES

Accidental Releases

130	32	4	12	1	4	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
131	32	5	12	1	1	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
132	32	6	12	1	2	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
133	32	7	12	0	4	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
134	32	1	12	0	2	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
135	32	2	12	0	0	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
136	32	3	12	1	5	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
137	32	4	12	1	4	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
138	32	5	12	1	1	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
139	32	6	12	1	2	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
140	32	7	12	0	4	AU	640.00 ACRES	TEXAS BLACKLAND PRAIRIES
141	32	1	12	0	2	AU	160.00 ACRES	TEXAS BLACKLAND PRAIRIES
142	32	2	12	0	0	AU	160.00 ACRES	TEXAS BLACKLAND PRAIRIES
143	32	3	12	1	5	AU	160.00 ACRES	TEXAS BLACKLAND PRAIRIES
144	32	4	12	1	4	AU	160.00 ACRES	TEXAS BLACKLAND PRAIRIES
145	32	5	12	1	1	AU	160.00 ACRES	TEXAS BLACKLAND PRAIRIES
146	32	6	12	1	2	AU	160.00 ACRES	TEXAS BLACKLAND PRAIRIES
147	32	7	12	0	4	AU	160.00 ACRES	TEXAS BLACKLAND PRAIRIES
148	32	1	12	0	2	AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
149	32	2	12	0	0	AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
150	32	3	12	1	5	AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
151	32	4	12	1	4	AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
152	32	5	12	1	1	AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
153	32	6	12	1	2	AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
154	32	7	12	0	4	AU	1280.00 ACRES	TEXAS BLACKLAND PRAIRIES
155	30	1	12	0	3	AU	960.00 ACRES	CENTRAL TEXAS PLATEAU
156	30	2	12	0	0	AU	960.00 ACRES	CENTRAL TEXAS PLATEAU
157	30	3	12	1	3	AU	960.00 ACRES	CENTRAL TEXAS PLATEAU
158	30	4	12	1	3	AU	960.00 ACRES	CENTRAL TEXAS PLATEAU
159	30	5	12	1	1	AU	960.00 ACRES	CENTRAL TEXAS PLATEAU
160	30	6	12	1	2	AU	960.00 ACRES	CENTRAL TEXAS PLATEAU
161	30	7	12	0	3	AU	960.00 ACRES	CENTRAL TEXAS PLATEAU
162	30	1	12	0	3	AU	320.00 ACRES	CENTRAL TEXAS PLATEAU
163	30	2	12	0	0	AU	320.00 ACRES	CENTRAL TEXAS PLATEAU
164	30	3	12	1	3	AU	320.00 ACRES	CENTRAL TEXAS PLATEAU
165	30	4	12	1	3	AU	320.00 ACRES	CENTRAL TEXAS PLATEAU
166	30	5	12	1	1	AU	320.00 ACRES	CENTRAL TEXAS PLATEAU
167	30	6	12	1	2	AU	320.00 ACRES	CENTRAL TEXAS PLATEAU
168	30	7	12	0	3	AU	320.00 ACRES	CENTRAL TEXAS PLATEAU
169	29	1	12	0	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
170	29	2	12	0	0	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
171	29	3	12	1	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
172	29	4	12	1	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
173	29	5	12	1	1	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
174	29	6	12	1	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
175	29	7	12	0	4	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
176	29	1	12	0	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
177	29	2	12	0	0	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
178	29	3	12	1	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
179	29	4	12	1	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
180	29	5	12	1	1	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
181	29	6	12	1	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
182	29	7	12	0	4	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
183	29	1	12	0	2	AU	320.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
184	29	2	12	0	0	AU	320.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
185	29	3	12	1	2	AU	320.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
186	29	4	12	1	3	AU	320.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
187	29	5	12	0	1	AU	320.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
188	29	6	12	1	3	AU	320.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
189	29	7	12	0	4	AU	320.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
190	29	1	12	0	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
191	29	2	12	0	0	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
192	29	3	12	1	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
193	29	4	12	0	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
194	29	5	12	0	1	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
195	29	6	12	1	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS

Accidental Releases

196	29	7	12	0	4	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
197	29	1	12	0	2	AU	160.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
198	29	2	12	0	0	AU	160.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
199	29	3	12	1	2	AU	160.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
200	29	4	12	0	3	AU	160.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
201	29	5	12	0	1	AU	160.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
202	29	6	12	1	3	AU	160.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
203	29	7	12	0	4	AU	160.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
204	29	1	12	0	2	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
205	29	2	12	0	0	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
206	29	3	12	1	2	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
207	29	4	12	1	3	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
208	29	5	12	1	1	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
209	29	6	12	1	3	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
210	29	7	12	0	4	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
211	29	1	12	0	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
212	29	2	12	0	0	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
213	29	3	12	1	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
214	29	4	12	1	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
215	29	5	12	1	1	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
216	29	6	12	1	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
217	29	7	12	0	4	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
218	29	1	12	0	2	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
219	29	2	12	0	0	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
220	29	3	12	1	2	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
221	29	4	12	1	3	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
222	29	5	12	1	1	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
223	29	6	12	1	3	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
224	29	7	12	0	4	AU	1280.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
225	29	1	12	0	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
226	29	2	12	0	0	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
227	29	3	12	1	2	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
228	29	4	12	1	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
229	29	5	12	1	1	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
230	29	6	12	1	3	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
231	29	7	12	0	4	AU	640.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
232	29	1	12	0	2	AU	2560.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
233	29	2	12	0	0	AU	2560.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
234	29	3	12	1	2	AU	2560.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
235	29	4	12	1	3	AU	2560.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
236	29	5	12	1	1	AU	2560.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
237	29	6	12	1	3	AU	2560.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
238	29	7	12	0	4	AU	2560.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
239	29	1	12	0	2	AU	1920.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
240	29	2	12	0	0	AU	1920.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
241	29	3	12	1	2	AU	1920.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
242	29	4	12	1	3	AU	1920.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
243	29	5	12	1	1	AU	1920.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
244	29	6	12	1	3	AU	1920.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
245	29	7	12	0	4	AU	1920.00 ACRES	CENTRAL OKLAHOMA TX. PLAINS
246	24	1	12	0	5	AU	320.00 ACRES	SOUTHERN DESERTS/TX.
247	24	2	12	0	0	AU	320.00 ACRES	SOUTHERN DESERTS/TX.
248	24	3	12	1	5	AU	320.00 ACRES	SOUTHERN DESERTS/TX.
249	24	4	12	1	1	AU	320.00 ACRES	SOUTHERN DESERTS/TX.
250	24	5	12	1	1	AU	320.00 ACRES	SOUTHERN DESERTS/TX.
251	24	6	12	1	4	AU	320.00 ACRES	SOUTHERN DESERTS/TX.
252	24	7	12	0	5	AU	320.00 ACRES	SOUTHERN DESERTS/TX.
253	24	1	12	0	5	AU	1280.00 ACRES	SOUTHERN DESERTS/TX.
254	24	2	12	0	0	AU	1280.00 ACRES	SOUTHERN DESERTS/TX.
255	24	3	12	1	5	AU	1280.00 ACRES	SOUTHERN DESERTS/TX.
256	24	4	12	1	1	AU	1280.00 ACRES	SOUTHERN DESERTS/TX.
257	24	5	12	1	1	AU	1280.00 ACRES	SOUTHERN DESERTS/TX.
258	24	6	12	1	4	AU	1280.00 ACRES	SOUTHERN DESERTS/TX.
259	24	7	12	0	5	AU	1280.00 ACRES	SOUTHERN DESERTS/TX.
260	24	1	12	0	5	AU	1920.00 ACRES	SOUTHERN DESERTS/NM
261	24	2	12	0	0	AU	1920.00 ACRES	SOUTHERN DESERTS/NM

Accidental Releases

262	24	3	12	1	5	AU	1920.00	ACRES	SOUTHERN DESERTS/NM
263	24	4	12	1	1	AU	1920.00	ACRES	SOUTHERN DESERTS/NM
264	24	5	12	1	1	AU	1920.00	ACRES	SOUTHERN DESERTS/NM
265	24	6	12	1	4	AU	1920.00	ACRES	SOUTHERN DESERTS/NM
266	24	7	12	0	5	AU	1920.00	ACRES	SOUTHERN DESERTS/NM
267	24	1	12	0	5	AU	320.00	ACRES	SOUTHERN DESERTS/NM
268	24	2	12	0	0	AU	320.00	ACRES	SOUTHERN DESERTS/NM
269	24	3	12	1	5	AU	320.00	ACRES	SOUTHERN DESERTS/NM
270	24	4	12	0	1	AU	320.00	ACRES	SOUTHERN DESERTS/NM
271	24	5	12	0	1	AU	320.00	ACRES	SOUTHERN DESERTS/NM
272	24	6	12	1	4	AU	320.00	ACRES	SOUTHERN DESERTS/NM
273	24	7	12	0	5	AU	320.00	ACRES	SOUTHERN DESERTS/NM
274	22	1	12	0	4	AU	1920.00	ACRES	ARIZONA/NM PLATEAU
275	22	2	12	0	0	AU	1920.00	ACRES	ARIZONA/NM PLATEAU
276	22	3	12	1	5	AU	1920.00	ACRES	ARIZONA/NM PLATEAU
277	22	4	12	1	1	AU	1920.00	ACRES	ARIZONA/NM PLATEAU
278	22	5	12	1	2	AU	1920.00	ACRES	ARIZONA/NM PLATEAU
279	22	6	12	1	4	AU	1920.00	ACRES	ARIZONA/NM PLATEAU
280	22	7	12	0	5	AU	1920.00	ACRES	ARIZONA/NM PLATEAU
281	22	1	12	0	4	AU	160.00	ACRES	ARIZONA/NM PLATEAU
282	22	2	12	0	0	AU	160.00	ACRES	ARIZONA/NM PLATEAU
283	22	3	12	1	5	AU	160.00	ACRES	ARIZONA/NM PLATEAU
284	22	4	12	0	1	AU	160.00	ACRES	ARIZONA/NM PLATEAU
285	22	5	12	0	2	AU	160.00	ACRES	ARIZONA/NM PLATEAU
286	22	6	12	1	4	AU	160.00	ACRES	ARIZONA/NM PLATEAU
287	22	7	12	0	5	AU	160.00	ACRES	ARIZONA/NM PLATEAU
288	22	1	12	0	5	AU	320.00	ACRES	ARIZONA/NM PLATEAU
289	22	2	12	0	0	AU	320.00	ACRES	ARIZONA/NM PLATEAU
290	22	3	12	1	5	AU	320.00	ACRES	ARIZONA/NM PLATEAU
291	22	4	12	0	1	AU	320.00	ACRES	ARIZONA/NM PLATEAU
292	22	5	12	0	1	AU	320.00	ACRES	ARIZONA/NM PLATEAU
293	22	6	12	1	4	AU	320.00	ACRES	ARIZONA/NM PLATEAU
294	22	7	12	0	5	AU	320.00	ACRES	ARIZONA/NM PLATEAU
295	22	1	12	0	5	AU	640.00	ACRES	ARIZONA/NM PLATEAU
296	22	2	12	0	0	AU	640.00	ACRES	ARIZONA/NM PLATEAU
297	22	3	12	1	5	AU	640.00	ACRES	ARIZONA/NM PLATEAU
298	22	4	12	1	1	AU	640.00	ACRES	ARIZONA/NM PLATEAU
299	22	5	12	1	1	AU	640.00	ACRES	ARIZONA/NM PLATEAU
300	22	6	12	1	4	AU	640.00	ACRES	ARIZONA /NM PLATEAU
301	22	7	12	0	5	AU	640.00	ACRES	ARIZONA/NM PLATEAU
302	23	1	12	0	4	AU	640.00	ACRES	ARIZONA/NM MOUNTAINS
303	23	2	12	0	0	AU	640.00	ACRES	ARIZONA/NM MOUNTAINS
304	23	3	12	1	5	AU	640.00	ACRES	ARIZONA/NM MOUNTAINS
305	23	4	12	1	1	AU	640.00	ACRES	ARIZONA/NM MOUNTAINS
306	23	5	12	1	5	AU	640.00	ACRES	ARIZONA/NM MOUNTAINS
307	23	6	12	1	5	AU	640.00	ACRES	ARIZONA/NM MOUNTAINS
308	23	7	12	0	3	AU	640.00	ACRES	ARIZONA/NM MOUNTAINS
309	25	1	12	0	5	AU	160.00	ACRES	WESTERN HIGH PLAINS/NM
310	25	2	12	0	0	AU	160.00	ACRES	WESTERN HIGH PLAINS/NM
311	25	3	12	1	3	AU	160.00	ACRES	WESTERN HIGH PLAINS/NM
312	25	4	12	0	2	AU	160.00	ACRES	WESTERN HIGH PLAINS/NM
313	25	5	12	0	1	AU	160.00	ACRES	WESTERN HIGH PLAINS/NM
314	25	6	12	1	1	AU	160.00	ACRES	WESTERN HIGH PLAINS/NM
315	25	7	12	0	4	AU	160.00	ACRES	WESTERN HIGH PLAINS/NM
316	25	1	12	0	5	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
317	25	2	12	0	0	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
318	25	3	12	1	3	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
319	25	4	12	0	2	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
320	25	5	12	0	1	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
321	25	6	12	1	1	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
322	25	7	12	0	4	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
323	25	1	12	0	5	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
324	25	2	12	0	0	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
325	25	3	12	1	3	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
326	25	4	12	0	2	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK
327	25	5	12	0	1	AU	160.00	ACRES	WESTERN HIGH PLAINS/OK

Accidental Releases

328	25	6	12	1	1 AU	160.00 ACRES	WESTERN HIGH PLAINS/OK
329	25	7	12	0	4 AU	160.00 ACRES	WESTERN HIGH PLAINS/OK
330	25	1	12	0	5 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
331	25	2	12	0	0 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
332	25	3	12	1	3 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
333	25	4	12	0	2 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
334	25	5	12	0	1 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
335	25	6	12	1	1 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
336	25	7	12	0	4 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
337	25	1	12	0	5 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
338	25	2	12	0	0 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
339	25	3	12	1	3 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
340	25	4	12	0	2 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
341	25	5	12	0	1 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
342	25	6	12	1	1 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
343	25	7	12	0	4 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
344	25	1	12	0	5 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
345	25	2	12	0	0 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
346	25	3	12	1	3 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
347	25	5	12	0	1 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
348	25	6	12	1	1 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
349	25	7	12	0	4 AU	160.00 ACRES	WESTERN HIGH PLAINS/TX.
350	25	1	12	0	5 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
351	25	2	12	0	0 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
352	25	3	12	1	3 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
353	25	4	12	0	2 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
354	25	5	12	0	1 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
355	25	6	12	1	1 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
356	25	7	12	0	4 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
357	25	1	12	0	5 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
358	25	2	12	0	0 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
359	25	3	12	1	3 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
360	25	4	12	0	2 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
361	25	5	12	0	1 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
362	25	6	12	1	1 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
363	25	7	12	0	4 AU	320.00 ACRES	WESTERN HIGH PLAINS/TX.
364	25	1	12	0	5 AU	1920.00 ACRES	WESTERN HIGH PLAINS/TX.
365	25	2	12	0	0 AU	1920.00 ACRES	WESTERN HIGH PLAINS/TX.
366	25	3	12	2	3 AU	1920.00 ACRES	WESTERN HIGH PLAINS/TX.
367	25	4	12	2	2 AU	1920.00 ACRES	WESTERN HIGH PLAINS/TX.
368	25	5	12	2	1 AU	1920.00 ACRES	WESTERN HIGH PLAINS/TX.
369	25	6	12	2	1 AU	1920.00 ACRES	WESTERN HIGH PLAINS/TX.
370	25	7	12	0	4 AU	1920.00 ACRES	WESTERN HIGH PLAINS/TX.
371	25	1	12	0	5 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
372	25	2	12	0	0 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
373	25	3	12	2	3 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
374	25	4	12	2	2 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
375	25	5	12	2	1 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
376	25	6	12	2	1 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
377	25	7	12	0	4 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
378	25	1	12	0	5 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
379	25	2	12	0	0 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
380	25	3	12	1	3 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
381	25	4	12	0	2 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
382	25	5	12	0	1 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
383	25	6	12	1	1 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
384	25	7	12	0	4 AU	640.00 ACRES	WESTERN HIGH PLAINS/TX.
385	25	1	12	0	5 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
386	25	2	12	0	0 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
387	25	3	12	1	3 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
388	25	4	12	1	2 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
389	25	5	12	1	1 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
390	25	6	12	1	1 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
391	25	7	12	0	4 AU	1280.00 ACRES	WESTERN HIGH PLAINS/TX.
392	21	1	12	0	4 AU	320.00 ACRES	SOUTHERN ROCKIES
393	21	2	12	0	0 AU	320.00 ACRES	SOUTHERN ROCKIES

Accidental Releases

394	21	3	12	0	5	AU	320.00 ACRES	SOUTHERN ROCKIES
395	21	4	12	0	1	AU	320.00 ACRES	SOUTHERN ROCKIES
396	21	5	12	0	1	AU	320.00 ACRES	SOUTHERN ROCKIES
397	21	6	12	1	4	AU	320.00 ACRES	SOUTHERN ROCKIES
398	21	7	12	0	3	AU	320.00 ACRES	SOUTHERN ROCKIES
399	26	1	12	0	3	AU	1920.00 ACRES	SOUTHWESTERN TABLELANDS
400	26	2	12	0	0	AU	1920.00 ACRES	SOUTHWESTERN TABLELANDS
401	26	3	12	1	3	AU	1920.00 ACRES	SOUTHWESTERN TABLELANDS
402	26	4	12	1	2	AU	1920.00 ACRES	SOUTHWESTERN TABLELANDS
403	26	5	12	1	1	AU	1920.00 ACRES	SOUTHWESTERN TABLELANDS
404	26	6	12	1	1	AU	1920.00 ACRES	SOUTHWESTERN TABLELANDS
405	26	7	12	0	4	AU	1920.00 ACRES	SOUTHWESTERN TABLELANDS
406	26	1	12	0	3	AU	320.00 ACRES	SOUTHWESTERN TABLELANDS
407	26	2	12	0	0	AU	320.00 ACRES	SOUTHWESTERN TABLELANDS
408	26	3	12	1	3	AU	320.00 ACRES	SOUTHWESTERN TABLELANDS
409	26	4	12	0	2	AU	320.00 ACRES	SOUTHWESTERN TABLELANDS
410	26	5	12	0	1	AU	320.00 ACRES	SOUTHWESTERN TABLELANDS
411	26	6	12	1	1	AU	320.00 ACRES	SOUTHWESTERN TABLELANDS
412	26	7	12	0	4	AU	320.00 ACRES	SOUTHWESTERN TABLELANDS
413	26	1	12	0	3	AU	160.00 ACRES	SOUTHWESTERN TABLELANDS
414	26	2	12	0	0	AU	160.00 ACRES	SOUTHWESTERN TABLELANDS
415	26	3	12	1	3	AU	160.00 ACRES	SOUTHWESTERN TABLELANDS
416	26	4	12	0	2	AU	160.00 ACRES	SOUTHWESTERN TABLELANDS
417	26	5	12	0	1	AU	160.00 ACRES	SOUTHWESTERN TABLELANDS
418	26	6	12	1	1	AU	160.00 ACRES	SOUTHWESTERN TABLELANDS
419	26	7	12	0	4	AU	160.00 ACRES	SOUTHWESTERN TABLELANDS
420	26	1	12	0	3	AU	960.00 ACRES	SOUTHWESTERN TABLELANDS/TX.
421	26	2	12	0	0	AU	960.00 ACRES	SOUTHWESTERN TABLELANDS/TX.
422	26	3	12	2	3	AU	960.00 ACRES	SOUTHWESTERN TABLELANDS/TX.
423	26	4	12	2	2	AU	960.00 ACRES	SOUTHWESTERN TABLELANDS/TX.
424	26	5	12	2	1	AU	960.00 ACRES	SOUTHWESTERN TABLELANDS/TX.
425	26	6	12	2	1	AU	960.00 ACRES	SOUTHWESTERN TABLELANDS/TX.
426	26	7	12	0	4	AU	960.00 ACRES	SOUTHWESTERN TABLELANDS/TX.
427	27	1	12	0	3	AU	160.00 ACRES	CENTRAL GREAT PLAINS/TX.
428	27	2	12	0	0	AU	160.00 ACRES	CENTRAL GREAT PLAINS/TX.
429	27	3	12	1	2	AU	160.00 ACRES	CENTRAL GREAT PLAINS/TX.
430	27	4	12	0	3	AU	160.00 ACRES	CENTRAL GREAT PLAINS/TX.
431	27	5	12	0	1	AU	160.00 ACRES	CENTRAL GREAT PLAINS/TX.
432	27	6	12	1	3	AU	160.00 ACRES	CENTRAL GREAT PLAINS/TX.
433	27	7	12	0	4	AU	160.00 ACRES	CENTRAL GREAT PLAINS/TX.
434	27	1	12	0	3	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
435	27	2	12	0	0	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
436	27	3	12	1	2	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
437	27	4	12	1	3	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
438	27	5	12	1	1	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
439	27	6	12	1	3	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
440	27	7	12	0	4	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
441	27	1	12	0	3	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
442	27	2	12	0	0	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
443	27	3	12	1	2	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
444	27	4	12	0	3	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
445	27	5	12	0	1	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
446	27	6	12	1	3	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
447	27	7	12	0	4	AU	640.00 ACRES	CENTRAL GREAT PLAINS/TX.
448	27	1	12	0	3	AU	960.00 ACRES	CENTRAL GREAT PLAINS/TX.
449	27	2	12	0	0	AU	960.00 ACRES	CENTRAL GREAT PLAINS/TX.
450	27	3	12	1	2	AU	960.00 ACRES	CENTRAL GREAT PLAINS/TX.
451	27	4	12	0	3	AU	960.00 ACRES	CENTRAL GREAT PLAINS/TX.
452	27	5	12	0	1	AU	960.00 ACRES	CENTRAL GREAT PLAINS/TX.
453	27	6	12	1	3	AU	960.00 ACRES	CENTRAL GREAT PLAINS/TX.
454	27	7	12	0	4	AU	960.00 ACRES	CENTRAL GREAT PLAINS/TX.
455	27	1	12	0	3	AU	160.00 ACRES	CENTRAL GREAT PLAINS/OK.
456	27	2	12	0	0	AU	160.00 ACRES	CENTRAL GREAT PLAINS/OK.
457	27	3	12	1	2	AU	160.00 ACRES	CENTRAL GREAT PLAINS/OK.
458	27	4	12	0	3	AU	160.00 ACRES	CENTRAL GREAT PLAINS/OK.
459	27	5	12	0	1	AU	160.00 ACRES	CENTRAL GREAT PLAINS/OK.

Accidental Releases

460	27	6	12	1	3	AU
461	27	7	12	0	4	AU
462	27	1	12	0	3	AU
463	27	2	12	0	0	AU
464	27	3	12	0	2	AU
465	27	4	12	0	2	AU
466	27	5	12	1	1	AU
467	27	6	12	1	3	AU
468	27	7	12	0	4	AU
469	27	1	12	0	3	AU
470	27	2	12	0	0	AU
471	27	3	12	1	2	AU
472	27	4	12	0	3	AU
473	27	5	12	0	1	AU
474	27	6	12	1	3	AU
475	27	7	12	0	4	AU
476	27	1	12	0	3	AU
477	27	2	12	0	0	AU
478	27	3	12	1	2	AU
479	27	4	12	0	3	AU
480	27	5	12	0	1	AU
481	27	6	12	1	3	AU
482	27	7	12	0	4	AU
483	27	1	12	0	3	AU
484	27	2	12	0	0	AU
485	27	3	12	1	2	AU
486	27	4	12	1	3	AU
487	27	5	12	1	1	AU
488	27	6	12	1	3	AU
489	27	7	12	0	4	AU
490	27	1	12	0	3	AU
491	27	2	12	0	0	AU
492	27	3	12	1	2	AU
493	27	4	12	0	3	AU
494	27	5	12	1	1	AU
495	27	6	12	1	3	AU
496	27	7	12	0	4	AU
497	27	1	12	0	3	AU
498	27	2	12	0	0	AU
499	27	3	12	1	2	AU
500	27	4	12	0	3	AU
501	27	5	12	0	1	AU
502	27	6	12	1	3	AU
503	27	7	12	0	4	AU
504	40	1	12	0	1	AU
505	40	2	12	0	0	AU
506	40	3	12	1	3	AU
507	40	4	12	1	3	AU
508	40	5	12	1	1	AU
509	40	6	12	1	5	AU
510	40	7	12	0	3	AU
511	40	1	12	0	1	AU
512	40	2	12	0	0	AU
513	40	3	12	1	3	AU
514	40	4	12	1	3	AU
515	40	5	12	1	1	AU
516	40	6	12	1	5	AU
517	40	7	12	0	3	AU
518	40	1	12	0	1	AU
519	40	2	12	0	0	AU
520	40	3	12	1	3	AU
521	40	4	12	1	3	AU
522	40	5	12	1	1	AU
523	40	6	12	1	5	AU
524	40	7	12	0	3	AU
525	40	1	12	0	1	AU

[illegible][illegible]

Accidental Releases

526	40	2	12	0	0	AU	160.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
527	40	3	12	1	3	AU	160.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
528	40	4	12	0	3	AU	160.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
529	40	5	12	0	1	AU	160.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
530	40	6	12	1	5	AU	160.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
531	40	7	12	0	3	AU	160.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
532	40	1	12	0	1	AU	6400.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
533	40	2	12	0	0	AU	6400.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
534	40	3	12	1	3	AU	6400.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
535	40	4	12	1	3	AU	6400.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
536	40	5	12	1	1	AU	6400.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
537	40	6	12	1	5	AU	6400.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
538	40	7	12	0	3	AU	2560.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
539	40	1	12	0	1	AU	1280.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
540	40	2	12	0	0	AU	1280.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
541	40	3	12	2	3	AU	1280.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
542	40	4	12	2	3	AU	1280.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
543	40	5	12	2	1	AU	1280.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
544	40	6	12	2	5	AU	1280.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
545	40	7	12	0	3	AU	1280.00	ACRES	CENTRAL IRREGULAR PLAINS/OK.
546	39	1	12	0	1	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
547	39	2	12	0	0	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
548	39	3	12	0	3	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
549	39	4	12	0	3	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
550	39	5	12	1	1	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
551	39	6	12	0	2	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
552	39	7	12	0	2	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
553	39	1	12	0	1	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
554	39	2	12	0	0	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
555	39	3	12	0	3	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
556	39	4	12	0	3	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
557	39	5	12	1	1	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
558	39	6	12	0	2	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
559	39	7	12	0	2	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
560	39	1	12	0	1	AU	1280.00	ACRES	OZARK HIGHLANDS/ARKANSAS
561	39	2	12	0	0	AU	1280.00	ACRES	OZARK HIGHLANDS/ARKANSAS
562	39	3	12	1	3	AU	1280.00	ACRES	OZARK HIGHLANDS/ARKANSAS
563	39	4	12	1	3	AU	1280.00	ACRES	OZARK HIGHLANDS/ARKANSAS
564	39	5	12	1	1	AU	1280.00	ACRES	OZARK HIGHLANDS/ARKANSAS
565	39	6	12	1	2	AU	1280.00	ACRES	OZARK HIGHLANDS/ARKANSAS
566	39	7	12	0	2	AU	1280.00	ACRES	OZARK HIGHLANDS/ARKANSAS
567	39	1	12	0	1	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
568	39	2	12	0	0	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
569	39	3	12	0	3	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
570	39	4	12	0	3	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
571	39	5	12	1	1	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
572	39	6	12	0	2	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
573	39	7	12	0	2	AU	160.00	ACRES	OZARK HIGHLANDS/ARKANSAS
574	38	1	12	0	1	AU	320.00	ACRES	BOSTON MOUNTAINS/ARKANSAS
575	38	2	12	0	0	AU	320.00	ACRES	BOSTON MOUNTAINS/ARKANSAS
576	38	3	12	1	3	AU	320.00	ACRES	BOSTON MOUNTAINS/ARKANSAS
577	38	4	12	0	3	AU	320.00	ACRES	BOSTON MOUNTAINS/ARKANSAS
578	38	5	12	1	1	AU	320.00	ACRES	BOSTON MOUNTAINS/ARKANSAS
579	38	6	12	1	2	AU	320.00	ACRES	BOSTON MOUNTAINS/ARKANSAS
580	38	7	12	0	2	AU	320.00	ACRES	BOSTON MOUNTAINS/ARKANSAS
581	37	1	12	0	1	AU	640.00	ACRES	ARKANSAS VALLEY/OK.
582	37	2	12	0	0	AU	640.00	ACRES	ARKANSAS VALLEY/OK.
583	37	3	12	1	2	AU	640.00	ACRES	ARKANSAS VALLEY/OK.
584	37	4	12	0	3	AU	640.00	ACRES	ARKANSAS VALLEY/OK.
585	37	5	12	1	1	AU	640.00	ACRES	ARKANSAS VALLEY/OK.
586	37	6	12	1	2	AU	640.00	ACRES	ARKANSAS VALLEY/OK.
587	37	7	12	0	1	AU	640.00	ACRES	ARKANSAS VALLEY/OK.
588	37	1	12	0	1	AU	320.00	ACRES	ARKANSAS VALLEY
589	37	2	12	0	0	AU	320.00	ACRES	ARKANSAS VALLEY
590	37	3	12	1	2	AU	320.00	ACRES	ARKANSAS VALLEY
591	37	4	12	1	3	AU	320.00	ACRES	ARKANSAS VALLEY

Accidental Releases

592	37	5	12	1	1	AU	320.00	ACRES	ARKANSAS VALLEY
593	37	6	12	1	2	AU	320.00	ACRES	ARKANSAS VALLEY
594	37	7	12	0	1	AU	320.00	ACRES	ARKANSAS VALLEY
595	37	1	12	0	1	AU	160.00	ACRES	ARKANSAS VALLEY
596	37	2	12	0	0	AU	160.00	ACRES	ARKANSAS VALLEY
597	37	3	12	1	2	AU	160.00	ACRES	ARKANSAS VALLEY
598	37	4	12	1	3	AU	160.00	ACRES	ARKANSAS VALLEY
599	37	5	12	1	1	AU	160.00	ACRES	ARKANSAS VALLEY
600	37	6	12	0	2	AU	160.00	ACRES	ARKANSAS VALLEY
601	37	7	12	0	1	AU	160.00	ACRES	ARKANSAS VALLEY
602	36	1	12	0	2	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
603	36	2	12	0	0	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
604	36	3	12	1	3	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
605	36	4	12	1	4	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
606	36	5	12	1	1	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
607	36	6	12	1	3	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
608	36	7	12	0	2	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
609	36	1	12	0	2	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
610	36	2	12	0	0	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
611	36	3	12	0	3	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
612	36	4	12	0	4	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
613	36	5	12	1	1	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
614	36	6	12	1	3	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
615	36	7	12	0	2	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
616	36	1	12	0	2	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
617	36	2	12	0	0	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
618	36	3	12	1	3	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
619	36	4	12	1	4	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
620	36	5	12	1	1	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
621	36	6	12	1	3	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
622	36	7	12	0	2	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
623	36	1	12	0	2	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
624	36	2	12	0	0	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
625	36	3	12	1	3	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
626	36	4	12	1	4	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
627	36	5	12	1	1	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
628	36	6	12	1	3	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
629	36	7	12	0	2	AU	640.00	ACRES	QUACHITA MOUNTAINS/ARKANSAS
630	35	1	12	0	2	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
631	35	2	12	0	0	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
632	35	3	12	1	3	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
633	35	4	12	0	4	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
634	35	5	12	1	1	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
635	35	6	12	1	2	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
636	35	7	12	0	2	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
637	35	1	12	0	2	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
638	35	2	12	0	0	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
639	35	3	12	1	3	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
640	35	4	12	0	4	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
641	35	5	12	1	1	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
642	35	6	12	1	2	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
643	35	7	12	0	2	AU	160.00	ACRES	SOUTH CENTRAL PLAINS/AR
644	35	1	12	0	2	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
645	35	2	12	0	0	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
646	35	3	12	1	3	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
647	35	4	12	1	4	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
648	35	5	12	1	1	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
649	35	6	12	1	2	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
650	35	7	12	0	2	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
651	35	1	12	0	2	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
652	35	2	12	0	0	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
653	35	3	12	1	3	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
654	35	4	12	1	4	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
655	35	5	12	1	1	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
656	35	6	12	1	2	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR
657	35	7	12	0	2	AU	960.00	ACRES	SOUTH CENTRAL PLAINS/AR

Accidental Releases

658	35	1	12	0	2 AU
659	35	2	12	0	0 AU
660	35	3	12	0	3 AU
661	35	4	12	1	4 AU
662	35	5	12	1	1 AU
663	35	6	12	1	2 AU
664	35	7	12	0	2 AU
665	35	1	12	0	2 AU
666	35	2	12	0	0 AU
667	35	3	12	1	3 AU
668	35	4	12	1	4 AU
669	35	5	12	1	1 AU
670	35	6	12	1	2 AU
671	35	7	12	0	2 AU
672	35	7	12	0	2 AU
673	35	2	12	0	0 AU
674	35	3	12	1	3 AU
675	35	4	12	1	4 AU
676	35	5	12	1	1 AU
677	35	6	12	1	2 AU
678	35	7	12	0	2 AU
679	35	1	12	0	2 AU
680	35	2	12	0	0 AU
681	35	3	12	0	3 AU
682	35	4	12	0	4 AU
683	35	5	12	1	1 AU
684	35	6	12	1	2 AU
685	35	7	12	0	2 AU
686	35	1	12	0	2 AU
687	35	2	12	0	0 AU
688	35	3	12	1	3 AU
689	35	4	12	1	4 AU
690	35	5	12	1	1 AU
691	35	6	12	1	2 AU
692	35	7	12	0	2 AU
693	35	1	12	0	2 AU
694	35	2	12	0	0 AU
695	35	3	12	1	3 AU
696	35	4	12	1	4 AU
697	35	5	12	1	1 AU
698	35	6	12	1	2 AU
699	35	7	12	0	2 AU
700	35	1	12	0	2 AU
701	35	2	12	0	0 AU
702	35	3	12	1	3 AU
703	35	4	12	1	4 AU
704	35	5	12	1	1 AU
705	35	6	12	1	2 AU
706	35	7	12	0	2 AU
707	35	1	12	0	2 AU
708	35	2	12	0	0 AU
709	35	3	12	1	3 AU
710	35	4	12	0	4 AU
711	35	5	12	1	1 AU
712	35	6	12	1	2 AU
713	35	7	12	0	2 AU
714	35	1	12	0	2 AU
715	35	2	12	0	0 AU
716	35	3	12	0	3 AU
717	35	4	12	0	4 AU
718	35	5	12	1	1 AU
719	35	6	12	1	2 AU
720	35	7	12	0	2 AU
721	35	1	12	0	2 AU
722	35	2	12	0	0 AU
723	35	3	12	1	3 AU

[illegible]

Accidental Releases

724	35	4	12	1	4 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/LA
725	35	5	12	1	1 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/LA
726	35	6	12	1	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/LA
727	35	7	12	0	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/LA
728	35	1	12	0	2 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/LA
729	35	2	12	0	0 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/LA
730	35	3	12	0	3 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/LA
731	35	4	12	0	4 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/LA
732	35	5	12	1	1 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/LA
733	35	6	12	1	2 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/LA
734	35	7	12	0	2 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/LA
735	35	1	12	0	2 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/LA
736	35	2	12	0	0 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/LA
737	35	3	12	1	3 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/LA
738	35	4	12	1	4 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/LA
739	35	5	12	1	1 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/LA
740	35	6	12	1	2 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/LA
741	35	7	12	0	2 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/LA
742	35	1	12	0	2 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/TX.
743	35	2	12	0	0 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/TX.
744	35	3	12	1	3 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/TX.
745	35	4	12	0	4 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/TX.
746	35	5	12	1	1 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/TX.
747	35	6	12	1	2 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/TX.
748	35	7	12	0	2 AU	960.00 ACRES	SOUTH CENTRAL PLAINS/TX.
749	35	1	12	0	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
750	35	2	12	0	0 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
751	35	3	12	1	3 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
752	35	4	12	1	4 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
753	35	5	12	1	1 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
754	35	6	12	1	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
755	35	1	12	0	2 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
756	35	2	12	0	0 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
757	35	3	12	0	3 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
758	35	4	12	1	4 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
759	35	5	12	1	1 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
760	35	6	12	1	2 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
761	35	7	12	0	2 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
762	35	1	12	0	2 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
763	35	2	12	0	0 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
764	35	3	12	0	3 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
765	35	4	12	1	4 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
766	35	5	12	1	1 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
767	35	6	12	1	2 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
768	35	7	12	0	2 AU	320.00 ACRES	SOUTH CENTRAL PLAINS/TX.
769	35	1	12	0	2 AU	1920.00 ACRES	SOUTH CENTRAL PLAINS/TX.
770	35	2	12	0	0 AU	1920.00 ACRES	SOUTH CENTRAL PLAINS/TX.
771	35	3	12	1	3 AU	1920.00 ACRES	SOUTH CENTRAL PLAINS/TX.
772	35	4	12	1	4 AU	1920.00 ACRES	SOUTH CENTRAL PLAINS/TX.
773	35	5	12	1	1 AU	1920.00 ACRES	SOUTH CENTRAL PLAINS/TX.
774	35	6	12	1	2 AU	1920.00 ACRES	SOUTH CENTRAL PLAINS/TX.
775	35	7	12	0	2 AU	1920.00 ACRES	SOUTH CENTRAL PLAINS/TX.
776	35	1	12	0	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
777	35	2	12	0	0 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
778	35	3	12	1	3 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
779	35	4	12	1	4 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
780	35	5	12	1	1 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
781	35	6	12	1	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
782	35	7	12	0	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
783	35	1	12	0	2 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
784	35	2	12	0	0 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
785	35	3	12	1	3 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
786	35	4	12	1	4 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
787	35	5	12	1	1 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
788	35	6	12	1	2 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
789	35	7	12	0	2 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.

Accidental Releases

790	35	1	12	0	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
791	35	2	12	0	0 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
792	35	3	12	0	3 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
793	35	4	12	0	4 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
794	35	5	12	1	1 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
795	35	6	12	1	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
796	35	7	12	0	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
797	35	1	12	0	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
798	35	2	12	0	0 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
799	35	3	12	1	3 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
800	35	4	12	1	4 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
801	35	5	12	1	1 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
802	35	6	12	1	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
803	35	7	12	0	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
804	35	1	12	0	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
805	35	2	12	0	0 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
806	35	3	12	1	3 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
807	35	4	12	1	4 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
808	35	5	12	1	1 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
809	35	6	12	1	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
810	35	7	12	0	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
811	35	1	12	0	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
812	35	2	12	0	0 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
813	35	3	12	1	3 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
814	35	4	12	1	4 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
815	35	5	12	1	1 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
816	35	6	12	1	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
817	35	7	12	0	2 AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
818	35	1	12	0	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
819	35	2	12	0	0 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
820	35	3	12	0	3 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
821	35	4	12	1	4 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
822	35	5	12	1	1 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
823	35	6	12	1	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
824	35	7	12	0	2 AU	160.00 ACRES	SOUTH CENTRAL PLAINS/TX.
825	35	1	12	0	2 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
826	35	2	12	0	0 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
827	35	3	12	0	3 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
828	35	4	12	0	4 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
829	35	5	12	1	1 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
830	35	6	12	1	2 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
831	35	7	12	0	2 AU	640.00 ACRES	SOUTH CENTRAL PLAINS/TX.
832	74	1	12	0	1 AU	5120.00 ACRES	MISSISSIPPI VALLEY LOESS PLAINS
833	74	2	12	0	0 AU	5120.00 ACRES	MISSISSIPPI VALLEY LOESS PLAINS
834	74	3	12	2	2 AU	5120.00 ACRES	MISSISSIPPI VALLEY LOESS PLAINS
835	74	4	12	2	5 AU	5120.00 ACRES	MISSISSIPPI VALLEY LOESS PLAINS
836	74	5	12	2	1 AU	5120.00 ACRES	MISSISSIPPI VALLEY LOESS PLAINS
837	74	6	12	2	1 AU	5120.00 ACRES	MISSISSIPPI VALLEY LOESS PLAINS
838	74	7	12	0	2 AU	5120.00 ACRES	MISSISSIPPI VALLEY LOESS PLAINS
839	73	1	12	0	1 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN
840	73	2	12	0	0 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN
841	73	3	12	0	2 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN
842	73	4	12	0	5 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN
843	73	5	12	1	1 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN
844	73	6	12	1	1 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN
845	73	7	12	0	1 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN
846	73	1	12	0	1 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
847	73	2	12	0	0 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
848	73	3	12	0	2 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
849	73	4	12	1	5 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
850	73	5	12	1	1 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
851	73	6	12	1	1 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
852	73	7	12	0	1 AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
853	73	1	12	0	1 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
854	73	2	12	0	0 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
855	73	3	12	0	2 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR

Accidental Releases

856	73	4	12	0	5	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
857	73	5	12	1	1	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
858	73	6	12	1	1	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
859	73	7	12	0	1	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
860	73	1	12	0	1	AU	160.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
861	73	2	12	0	0	AU	160.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
862	73	3	12	0	2	AU	160.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
863	73	4	12	1	5	AU	160.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
864	73	6	12	1	1	AU	160.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
865	73	7	12	0	1	AU	160.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/AR
866	73	1	12	0	1	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
867	73	2	12	0	0	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
868	73	3	12	1	2	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
869	73	4	12	1	5	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
870	73	5	12	1	1	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
871	73	6	12	1	1	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
872	73	7	12	0	1	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
873	73	1	12	0	1	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
874	73	2	12	0	0	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
875	73	3	12	0	2	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
876	73	4	12	1	5	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
877	73	5	12	1	1	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
878	73	6	12	1	1	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
879	73	7	12	0	1	AU	640.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
880	73	1	12	0	1	AU	6400.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
881	73	2	12	0	0	AU	6400.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
882	73	3	12	2	2	AU	6400.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
883	73	4	12	2	5	AU	6400.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
884	73	5	12	2	1	AU	6400.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
885	73	6	12	2	1	AU	6400.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
886	73	7	12	0	1	AU	6400.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
887	73	1	12	0	1	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
888	73	2	12	0	0	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
889	73	3	12	0	2	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
890	73	4	12	1	5	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
891	73	5	12	1	1	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
892	73	6	12	1	1	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
893	73	7	12	0	1	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
894	73	1	12	0	1	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
895	73	2	12	0	0	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
896	73	3	12	1	2	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
897	73	4	12	0	5	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
898	73	5	12	0	1	AU	320.00	ACRES	MISSISSIPPI	ALLUVIAL	PLAIN/LA
899	73	6	12	1	1						

Accidental Releases

922	73	1	12	0	1 AU	640.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
923	73	2	12	0	0 AU	640.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
924	73	3	12	1	2 AU	640.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
925	73	4	12	1	5 AU	640.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
926	73	5	12	1	1 AU	640.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
927	73	6	12	1	1 AU	640.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
928	73	7	12	0	1 AU	640.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
929	73	1	12	0	1 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
930	73	2	12	0	0 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
931	73	3	12	0	2 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
932	73	4	12	1	5 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
933	73	5	12	1	1 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
934	73	6	12	1	1 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
935	73	7	12	0	1 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
936	73	1	12	0	1 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
937	73	2	12	0	0 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
938	73	3	12	0	2 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
939	73	4	12	0	5 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
940	73	5	12	1	1 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
941	73	6	12	1	1 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
942	73	7	12	0	1 AU	320.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
943	73	1	12	0	1 AU	6400.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
944	73	2	12	0	0 AU	6400.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
945	73	3	12	2	2 AU	6400.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
946	73	4	12	2	5 AU	6400.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
947	73	5	12	2	1 AU	6400.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
948	73	6	12	2	1 AU	6400.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
949	73	7	12	0	1 AU	6400.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
950	73	1	12	0	1 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
951	73	2	12	0	0 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
952	73	3	12	1	2 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
953	73	4	12	1	5 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
954	73	5	12	1	1 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
955	73	6	12	1	1 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
956	73	7	12	0	1 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
957	73	1	12	0	1 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
958	73	2	12	0	0 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
959	73	3	12	1	2 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
960	73	4	12	1	5 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
961	73	5	12	1	1 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
962	73	6	12	1	1 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
963	73	7	12	0	1 AU	1280.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/LA
964	34	1	12	0	1 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
965	34	2	12	0	0 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
966	34	3	12	0	2 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
967	34	4	12	1	4 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
968	34	5	12	1	1 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
969	34	6	12	1	2 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
970	34	7	12	0	3 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
971	34	1	12	0	1 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
972	34	2	12	0	0 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
973	34	3	12	1	2 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
974	34	4	12	1	4 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
975	34	5	12	1	1 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
976	34	6	12	1	2 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
977	34	7	12	0	3 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
978	34	1	12	0	1 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
979	34	2	12	0	0 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
980	34	3	12	1	2 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
981	34	4	12	1	4 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
982	34	5	12	1	1 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
983	34	6	12	1	2 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
984	34	7	12	0	3 AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
985	34	1	12	0	1 AU	6400.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
986	34	2	12	0	0 AU	6400.00 ACRES	WESTERN GULF COASTAL PLAIN/LA
987	34	3	12	2	2 AU	6400.00 ACRES	WESTERN GULF COASTAL PLAIN/LA

Accidental Releases

988	34	4	12	2	4	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/LA
989	34	5	12	2	1	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/LA
990	34	6	12	2	2	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/LA
991	34	7	12	0	3	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/LA
992	34	1	12	0	1	AU	160.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
993	34	2	12	0	0	AU	160.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
994	34	3	12	0	2	AU	160.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
995	34	4	12	0	4	AU	160.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
996	34	5	12	1	1	AU	160.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
997	34	6	12	1	2	AU	160.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
998	34	7	12	0	3	AU	160.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
999	34	1	12	0	1	AU	1280.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1000	34	2	12	0	0	AU	1280.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1001	34	3	12	1	2	AU	1280.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1002	34	4	12	1	4	AU	1280.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1003	34	5	12	1	1	AU	1280.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1004	34	6	12	1	2	AU	1280.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1005	34	7	12	0	3	AU	1280.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1006	34	1	12	0	1	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1007	34	2	12	0	0	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1008	34	3	12	2	2	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1009	34	4	12	2	4	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1010	34	5	12	2	1	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1011	34	6	12	2	2	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1012	34	7	12	0	0	AU	6400.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1013	34	1	12	0	1	AU	320.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1014	34	2	12	0	0	AU	320.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1015	34	3	12	0	2	AU	320.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1016	34	4	12	1	4	AU	320.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1017	34	5	12	1	1	AU	320.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1018	34	6	12	1	2	AU	320.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1019	34	7	12	0	3	AU	320.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1020	34	1	12	0	1	AU	960.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1021	34	2	12	0	0	AU	960.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1022	34	3	12	0	2	AU	960.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1023	34	4	12	1	4	AU	960.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1024	34	5	12	1	1	AU	960.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1025	34	6	12	1	2	AU	960.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1026	34	7	12	0	3	AU	960.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1027	34	1	12	0	1	AU	1920.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1028	34	2	12	0	0	AU	1920.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1029	34	3	12	1	2	AU	1920.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1030	34	4	12	1	4	AU	1920.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1031	34	5	12	1	1	AU	1920.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1032	34	6	12	1	2	AU	1920.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1033	34	7	12	0	3	AU	1920.00	ACRES	WESTERN GULF COASTAL PLAIN/TX.
1034	34	1	12	0	1	AU	6400.00	ACRES	WESTERN GULF

Accidental Releases

1054	34	7	12	0	3	AU	6400.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1055	34	1	12	0	1	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1056	34	2	12	0	0	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1057	34	3	12	1	2	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1058	34	4	12	1	4	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1059	34	5	12	1	1	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1060	34	6	12	1	2	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1061	34	7	12	0	3	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1062	34	1	12	0	1	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1063	34	2	12	0	0	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1064	34	3	12	1	2	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1065	34	4	12	1	4	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1066	34	5	12	1	1	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1067	34	6	12	1	2	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1068	34	7	12	0	3	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1069	34	1	12	0	1	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1070	34	2	12	0	0	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1071	34	3	12	1	2	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1072	34	4	12	1	4	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1073	34	5	12	1	1	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1074	34	6	12	1	2	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1075	34	7	12	0	3	AU	1280.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1076	34	1	12	0	1	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1077	34	2	12	0	0	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1078	34	3	12	0	2	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1079	34	4	12	1	4	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1080	34	5	12	1	1	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1081	34	6	12	1	2	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1082	34	7	12	0	3	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1083	34	1	12	0	1	AU	2560.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1084	34	2	12	0	0	AU	2560.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1085	34	3	12	1	2	AU	2560.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1086	34	4	12	1	4	AU	2560.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1087	34	5	12	1	1	AU	2560.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1088	34	6	12	1	2	AU	2560.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1089	34	7	12	0	3	AU	2560.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1090	34	1	12	0	1	AU	3200.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1091	34	2	12	0	0	AU	3200.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1092	34	3	12	1	2	AU	3200.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1093	34	4	12	1	4	AU	3200.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1094	34	5	12	1	1	AU	3200.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1095	34	6	12	1	2	AU	3200.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1096	34	7	12	0	3	AU	3200.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1097	34	1	12	0	1	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1098	34	2	12	0	0	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1099	34	3	12	0	2	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1100	34	4	12	0	4	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1101	34	5	12	1	1	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1102	34	6	12	1	2	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1103	34	7	12	0	3	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1104	34	1	12	0	1	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1105	34	2	12	0	0	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1106	34	3	12	0	2	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1107	34	4	12	1	4	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1108	34	5	12	1	1	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1109	34	6	12	1	2	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1110	34	7	12	0	3	AU	320.00 ACRES	WESTERN GULF COASTAL PLAIN/TX.
1111	35	7	12	0	2	AU	1280.00 ACRES	SOUTH CENTRAL PLAINS/TX.
1112	73	5	12	1	1	AU	160.00 ACRES	MISSISSIPPI ALLUVIAL PLAIN/AR
1113	34	1	12	0	1	AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN
1114	34	2	12	0	0	AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN
1115	34	3	12	0	2	AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN
1116	34	4	12	1	4	AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN
1117	34	5	12	1	1	AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN
1118	34	6	12	1	2	AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN
1119	34	7	12	0	3	AU	640.00 ACRES	WESTERN GULF COASTAL PLAIN

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Record#	ec	func	prob	imp	vul	spcode	spval	units	substr(sitedesc,1,40)	staff
1	73	1	22	0	1	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
2	73	2	22	0	0	AU	7933800.00	ACRES	INSECTICIDES	
3	73	3	22	2	2	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
4	73	4	22	0	5	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
5	73	5	22	0	4	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
6	73	6	22	2	2	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
7	73	7	22	0	1	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
8	40	1	22	0	1	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
9	40	2	22	0	0	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
10	40	3	22	2	3	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
11	40	4	22	0	3	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
12	40	5	22	0	1	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
13	40	6	22	2	5	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
14	40	7	22	0	3	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
15	39	1	22	0	1	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
16	39	2	22	0	0	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
17	39	3	22	2	3	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
18	39	4	22	0	3	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
19	39	5	22	0	1	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
20	39	6	22	2	2	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
21	39	7	22	0	2	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
22	37	1	22	0	1	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
23	37	2	22	0	0	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
24	37	3	22	2	2	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
25	37	4	22	0	3	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
26	37	5	22	0	1	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
27	37	6	22	2	2	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
28	37	7	22	0	1	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
29	36	1	22	0	2	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
30	36	2	22	0	0	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
31	36	3	22	2	3	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
32	36	4	22	0	4	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
33	36	5	22	0	1	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
34	36	6	22	2	3	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
35	36	7	22	0	2	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
36	35	1	22	0	2	AU	1392850.00	ACRES	INSECTICIDES	
37	35	2	22	0	0	AU	1392850.00	ACRES	INSECTICIDES	
38	35	3	22	2	3	AU	1392850.00	ACRES	INSECTICIDES	
39	35	4	22	0	4	AU	1392850.00	ACRES	INSECTICIDES	
40	35	5	22	0	1	AU	1392850.00	ACRES	INSECTICIDES	
41	35	6	22	2	2	AU	1392850.00	ACRES	INSECTICIDES	
42	35	7	22	0	2	AU	1392850.00	ACRES	INSECTICIDES	
43	34	1	22	0	1	AU	2695600.00	ACRES	INSECTICIDES	
44	34	2	22	0	0	AU	2695600.00	ACRES	INSECTICIDES	
45	34	3	22	2	2	AU	2695600.00	ACRES	INSECTICIDES	
46	34	4	22	0	4	AU	2695600.00	ACRES	INSECTICIDES	
47	34	5	22	0	1	AU	2695600.00	ACRES	INSECTICIDES	
48	34	6	22	2	2	AU	2695600.00	ACRES	INSECTICIDES	
49	34	7	22	0	3	AU	2695600.00	ACRES	INSECTICIDES	
50	33	1	22	0	2	AU	1105000.00	ACRES	INSECTICIDES	
51	33	2	22	0	0	AU	1105000.00	ACRES	INSECTICIDES	
52	33	3	22	2	2	AU	1105000.00	ACRES	INSECTICIDES	
53	33	4	22	0	4	AU	1105000.00	ACRES	INSECTICIDES	
54	33	5	22	0	1	AU	1105000.00	ACRES	INSECTICIDES	
55	33	6	22	2	2	AU	1105000.00	ACRES	INSECTICIDES	
56	33	7	22	0	3	AU	1105000.00	ACRES	INSECTICIDES	
57	32	1	22	0	2	AU	2423990.00	ACRES	INSECTICIDES	
58	32	2	22	0	0	AU	2423990.00	ACRES	INSECTICIDES	
59	32	3	22	2	5	AU	2423990.00	ACRES	INSECTICIDES	
60	32	4	22	0	4	AU	2423990.00	ACRES	INSECTICIDES	
61	32	5	22	0	1	AU	2423990.00	ACRES	INSECTICIDES	
62	32	6	22	2	2	AU	2423990.00	ACRES	INSECTICIDES	
63	32	7	22	0	4	AU	2423990.00	ACRES	INSECTICIDES	

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64	31	1	22	0	3 AU	1180100.00 ACRES	INSECTICIDES
65	31	2	22	0	0 AU	1180100.00 ACRES	INSECTICIDES
66	31	3	22	2	3 AU	1180100.00 ACRES	INSECTICIDES
67	31	4	22	0	3 AU	1180100.00 ACRES	INSECTICIDES
68	31	5	22	0	1 AU	1180100.00 ACRES	INSECTICIDES
69	31	6	22	2	1 AU	1180100.00 ACRES	INSECTICIDES
70	31	7	22	0	3 AU	1180100.00 ACRES	INSECTICIDES
71	30	1	22	0	3 AU	515300.00 ACRES	INSECTICIDES
72	30	2	22	0	0 AU	515300.00 ACRES	INSECTICIDES
73	30	3	22	2	3 AU	515300.00 ACRES	INSECTICIDES
74	30	4	22	0	3 AU	515300.00 ACRES	INSECTICIDES
75	30	5	22	0	1 AU	515300.00 ACRES	INSECTICIDES
76	30	6	22	2	2 AU	515300.00 ACRES	INSECTICIDES
77	30	7	22	0	3 AU	515300.00 ACRES	INSECTICIDES
78	29	1	22	0	2 AU	2996150.00 ACRES	INSECTICIDES
79	29	2	22	0	0 AU	2996150.00 ACRES	INSECTICIDES
80	29	3	22	2	2 AU	2996150.00 ACRES	INSECTICIDES
81	29	4	22	0	3 AU	2996150.00 ACRES	INSECTICIDES
82	29	5	22	0	1 AU	2996150.00 ACRES	INSECTICIDES
83	29	6	22	2	3 AU	2996150.00 ACRES	INSECTICIDES
84	29	7	22	0	4 AU	2996150.00 ACRES	INSECTICIDES
85	27	1	22	0	3 AU	9304650.00 ACRES	INSECTICIDES
86	27	2	22	0	0 AU	9304650.00 ACRES	INSECTICIDES
87	27	3	22	2	2 AU	9304650.00 ACRES	INSECTICIDES
88	27	4	22	0	3 AU	9304650.00 ACRES	INSECTICIDES
89	27	5	22	0	1 AU	9304650.00 ACRES	INSECTICIDES
90	27	6	22	2	3 AU	9304650.00 ACRES	INSECTICIDES
91	27	7	22	0	4 AU	9304650.00 ACRES	INSECTICIDES
92	26	1	22	0	3 AU	1854350.00 ACRES	INSECTICIDES
93	26	2	22	0	0 AU	1854350.00 ACRES	INSECTICIDES
94	26	3	22	2	3 AU	1854350.00 ACRES	INSECTICIDES
95	26	4	22	0	2 AU	1854350.00 ACRES	INSECTICIDES
96	26	5	22	0	1 AU	1854350.00 ACRES	INSECTICIDES
97	26	6	22	2	1 AU	1854350.00 ACRES	INSECTICIDES
98	26	7	22	0	4 AU	1854350.00 ACRES	INSECTICIDES
99	25	1	22	0	5 AU	8299300.00 ACRES	INSECTICIDES
100	25	2	22	0	0 AU	8299300.00 ACRES	INSECTICIDES
101	25	3	22	2	3 AU	8299300.00 ACRES	INSECTICIDES
102	25	4	22	0	2 AU	8299300.00 ACRES	INSECTICIDES
103	25	5	22	0	1 AU	8299300.00 ACRES	INSECTICIDES
104	25	6	22	2	1 AU	8299300.00 ACRES	INSECTICIDES
105	25	7	22	0	4 AU	8299300.00 ACRES	INSECTICIDES
106	24	1	22	0	5 AU	256100.00 ACRES	INSECTICIDES
107	24	2	22	0	0 AU	256100.00 ACRES	INSECTICIDES
108	24	3	22	2	5 AU	256100.00 ACRES	INSECTICIDES
109	24	4	22	0	1 AU	256100.00 ACRES	INSECTICIDES
110	24	5	22	0	1 AU	256100.00 ACRES	INSECTICIDES
111	24	6	22	3	4 AU	256100.00 ACRES	INSECTICIDES
112	24	7	22	0	5 AU	256100.00 ACRES	INSECTICIDES
113	35	1	22	0	2 AU	635000.00 ACRES	
114	35	2	22	0	0 AU	635000.00 ACRES	
115	35	3	22	4	3 AU	635000.00 ACRES	
116	35	4	22	4	4 AU	635000.00 ACRES	
117	35	5	22	0	1 AU	635000.00 ACRES	
118	35	6	22	4	2 AU	635000.00 ACRES	
119	35	7	22	4	2 AU	635000.00 ACRES	
120	73	1	22	0	1 AU	482000.00 ACRES	
121	73	2	22	0	0 AU	482000.00 ACRES	
122	73	3	22	4	2 AU	482000.00 ACRES	
123	73	4	22	4	5 AU	482000.00 ACRES	
124	73	5	22	0	1 AU	482000.00 ACRES	
125	73	6	22	4	1 AU	482000.00 ACRES	
126	73	7	22	4	1 AU	482000.00 ACRES	

Airbone Lead

Record#	ec	func	prob	imp	vul	spcode	spval	units	substr(sitedesc,1,40)	staff
1	32	1	16	0	2	AU	3100.00	ACRES		
2	32	2	16	0	0	AU	3100.00	ACRES		
3	32	3	16	1	2	AU	3100.00	ACRES		
4	32	4	16	1	4	AU	3100.00	ACRES		
5	32	5	16	1	1	AU	3100.00	ACRES		
6	32	6	16	1	2	AU	3100.00	ACRES		
7	32	7	16	1	4	AU	3100.00	ACRES		
8	32	1	16	0	2	AU	3100.00	ACRES		
9	32	2	16	0	0	AU	3100.00	ACRES		
10	32	3	16	1	2	AU	3100.00	ACRES		
11	32	4	16	1	4	AU	3100.00	ACRES		
12	32	5	16	1	1	AU	3100.00	ACRES		
13	32	6	16	1	2	AU	3100.00	ACRES		
14	32	7	16	1	4	AU	3100.00	ACRES		
15	32	1	16	0	2	AU	3100.00	ACRES		
16	32	2	16	0	0	AU	3100.00	ACRES		
17	32	3	16	1	2	AU	3100.00	ACRES		
18	32	4	16	1	4	AU	3100.00	ACRES		
19	32	5	16	1	1	AU	3100.00	ACRES		
20	32	6	16	1	2	AU	3100.00	ACRES		
21	32	7	16	1	4	AU	3100.00	ACRES		
22	73	1	16	0	1	AU	3100.00	ACRES		
23	73	2	16	0	0	AU	3100.00	ACRES		
24	73	3	16	1	2	AU	3100.00	ACRES		
25	73	4	16	1	5	AU	3100.00	ACRES		
26	73	5	16	1	1	AU	3100.00	ACRES		
27	73	6	16	1	1	AU	3100.00	ACRES		
28	73	7	16	1	1	AU	3100.00	ACRES		

Air Toxic

Record#	ec	func	prob	imp	vul	spcode	spval	units	substr(sitedesc,1,40)	staff
1	29	1	18	0	2	AU	4704000.00	ACRES	CENTRAL OK/TX PLAINS	
2	29	2	18	0	0	AU	4704000.00	ACRES	CENTRAL OK/TX PLAINS	
3	29	3	18	1	2	AU	4704000.00	ACRES	CENTRAL OK/TX PLAINS	
4	29	4	18	1	3	AU	4704000.00	ACRES	CENTRAL OK/TX PLAINS	
5	29	5	18	1	1	AU	4704000.00	ACRES	CENTRAL OK/TX PLAINS	
6	29	6	18	1	3	AU	4704000.00	ACRES	CENTRAL OK/TX PLAINS	
7	29	7	18	1	4	AU	4704000.00	ACRES	CENTRAL OK/TX PLAINS	
8	32	1	18	0	2	AU	6272000.00	ACRES	TEXAS BLACKLAND PRAIRES	
9	32	2	18	0	0	AU	6272000.00	ACRES	TEXAS BLACKLAND PRAIRES	
10	32	3	18	1	2	AU	6272000.00	ACRES	TEXAS BLACKLAND PRAIRES	
11	32	4	18	1	4	AU	6272000.00	ACRES	TEXAS BLACKLAND PRAIRES	
12	32	5	18	1	1	AU	6272000.00	ACRES	TEXAS BLACKLAND PRAIRES	
13	32	6	18	1	1	AU	6272000.00	ACRES	TEXAS BLACKLAND PRAIRES	
14	32	7	18	1	4	AU	6272000.00	ACRES	TEXAS BLACKLAND PRAIRES	
15	74	1	18	0	1	AU	864000.00	ACRES	MISS. BALLEY LOESS PLAINS	
16	74	2	18	0	0	AU	864000.00	ACRES	MISS. VALLEY LOESS PLAINS	
17	74	3	18	1	2	AU	864000.00	ACRES	MISS. VALLEY LOESS PLAINS	
18	74	4	18	1	5	AU	864000.00	ACRES	MISS. VALLEY LOESS PLAINS	
19	74	5	18	1	1	AU	864000.00	ACRES	MISS. VALLEY LOESS PLAINS	
20	74	6	18	1	1	AU	864000.00	ACRES	MISS. VALLEY LOESS PLAINS	
21	74	7	18	1	2	AU	864000.00	ACRES	MISS. VALLEY LOESS PLAINS	
22	34	1	18	0	1	AU	9792000.00	ACRES	WESTERN GULF COASTAL PLAIN	
23	34	2	18	0	0	AU	9792000.00	ACRES	WESTERN GULF COASTAL PLAIN	
24	34	3	18	1	2	AU	9792000.00	ACRES	WESTERN GULF COASTAL PLAIN	
25	34	4	18	1	4	AU	9792000.00	ACRES	WESTERN GULF COASTAL PLAIN	
26	34	5	18	1	1	AU	9792000.00	ACRES	WESTERN GULF COASTAL PLAIN	
27	34	6	18	1	2	AU	9792000.00	ACRES	WESTERN GULF COASTAL PLAIN	
28	34	7	18	1	3	AU	9792000.00	ACRES	WESTERN GULF COASTAL PLAIN	
29	65	1	18	0	1	AU	64000.00	ACRES	SOUTHEASTERN PLAINS	
30	65	2	18	0	0	AU	64000.00	ACRES	SOUTHEASTERN PLAINS	
31	65	3	18	1	2	AU	64000.00	ACRES	SOUTHEASTERN PLAINS	
32	65	4	18	1	5	AU	64000.00	ACRES	SOUTHEASTERN PLAINS	
33	65	5	18	1	1	AU	64000.00	ACRES	SOUTHEASTERN PLAINS	
34	65	6	18	1	3	AU	64000.00	ACRES	SOUTHEASTERN PLAINS	
35	65	7	18	1	2	AU	64000.00	ACRES	SOUTHEASTERN PLAINS	
36	31	1	18	0	3	AU	192000.00	ACRES	SOUTHERN TEXAS PLAINS	
37	31	2	18	0	0	AU	192000.00	ACRES	SOUTHERN TEXAS PLAINS	
38	31	3	18	1	3	AU	192000.00	ACRES	SOUTHERN TEXAS PLAINS	
39	31	4	18	1	3	AU	192000.00	ACRES	SOUTHERN TEXAS PLAINS	
40	31	5	18	1	1	AU	192000.00	ACRES	SOUTHERN TEXAS PLAINS	
41	31	6	18	1	1	AU	192000.00	ACRES	SOUTHERN TEXAS PLAINS	
42	31	7	18	1	3	AU	192000.00	ACRES	SOUTHERN TEXAS PLAINS	
43	33	1	18	0	2	AU	480000.00	ACRES	EAST CENTRAL TEXAS PLAINS	
44	33	2	18	0	0	AU	480000.00	ACRES	EAST CENTRAL TEXAS PLAINS	
45	33	3	18	1	2	AU	480000.00	ACRES	EAST CENTRAL TEXAS PLAINS	
46	33	4	18	1	4	AU	480000.00	ACRES	EAST CENTRAL TEXAS PLAINS	
47	33	5	18	1	1	AU	480000.00	ACRES	EAST CENTRAL TEXAS PLAINS	
48	33	6	18	1	2	AU	480000.00	ACRES	EAST CENTRAL TEXAS PLAINS	
49	33	7	18	1	3	AU	480000.00	ACRES	EAST CENTRAL TEXAS PLAINS	
50	22	1	18	0	4	AU	608000.00	ACRES	ARIZONA/NEW MEXICO PLATEAU	
51	22	2	18	0	0	AU	608000.00	ACRES	ARIZONA/NEW MEXICO PLATEAU	
52	22	3	18	1	5	AU	608000.00	ACRES	ARIZONA/NEW MEXICO PLATEAU	
53	22	4	18	1	1	AU	608000.00	ACRES	ARIZONA/NEW MEXICO PLATEAU	
54	22	5	18	1	2	AU	608000.00	ACRES	ARIZONA/NEW MEXICO PLATEAU	
55	22	6	18	1	4	AU	608000.00	ACRES	ARIZONA/NEW MEXICO PLATEAU	
56	22	7	18	1	5	AU	608000.00	ACRES	ARIZONA/NEW MEXICO PLATEAU	
57	24	1	18	0	5	AU	544000.00	ACRES	SOUTHERN DESERTS	
58	24	2	18	0	0	AU	544000.00	ACRES	SOUTHERN DESERTS	
59	24	3	18	1	5	AU	544000.00	ACRES	SOUTHERN DESERTS	
60	24	4	18	1	1	AU	544000.00	ACRES	SOUTHERN DESERTS	
61	24	5	18	1	1	AU	544000.00	ACRES	SOUTHERN DESERTS	
62	24	6	18	1	4	AU	544000.00	ACRES	SOUTHERN DESERTS	
63	24	7	18	1	5	AU	544000.00	ACRES	SOUTHERN DESERTS	

Air Toxic

64	25	1	18	0	5	AU	832000.00	ACRES	WESTERN HIGHPLAINS
65	25	2	18	0	0	AU	832000.00	ACRES	WESTERN HIGHPLAINS
66	25	3	18	1	3	AU	832000.00	ACRES	WESTERN HIGHPLAINS
67	25	4	18	1	2	AU	832000.00	ACRES	WESTERN HIGHPLAINS
68	25	5	18	1	1	AU	832000.00	ACRES	WESTERN HIGHPLAINS
69	25	6	18	1	1	AU	832000.00	ACRES	WESTERN HIGHPLAINS
70	25	7	18	1	4	AU	832000.00	ACRES	WESTERN HIGHPLAINS
71	26	1	18	0	3	AU	256000.00	ACRES	SOUTHWESTERN TABLELANDS
72	26	2	18	0	0	AU	256000.00	ACRES	SOUTHWESTERN TABLELANDS
73	26	3	18	1	3	AU	256000.00	ACRES	SOUTHWESTERN TABLELANDS
74	26	4	18	1	2	AU	256000.00	ACRES	SOUTHWESTERN TABLELANDS
75	26	5	18	1	1	AU	256000.00	ACRES	SOUTHWESTERN TABLELANDS
76	26	6	18	1	1	AU	256000.00	ACRES	SOUTHWESTERN TABLELANDS
77	26	7	18	1	4	AU	256000.00	ACRES	SOUTHWESTERN TABLELANDS
78	27	1	18	0	3	AU	1024000.00	ACRES	CENTRAL GREAT PLAINS
79	27	2	18	0	0	AU	1024000.00	ACRES	CENTRAL GREAT PLAINS
80	27	3	18	1	2	AU	1024000.00	ACRES	CENTRAL GREAT PLAINS
81	27	4	18	1	3	AU	1024000.00	ACRES	CENTRAL GREAT PLAINS
82	27	5	18	1	1	AU	1024000.00	ACRES	CENTRAL GREAT PLAINS
83	27	6	18	1	3	AU	1024000.00	ACRES	CENTRAL GREAT PLAINS
84	27	7	18	1	4	AU	1024000.00	ACRES	CENTRAL GREAT PLAINS
85	40	1	18	0	1	AU	2272000.00	ACRES	CENTRAL IRREGULAR PLAINS
86	40	2	18	0	0	AU	2272000.00	ACRES	CENTRAL IRREGULAR PLAINS
87	40	3	18	1	3	AU	2272000.00	ACRES	CENTRAL IRREGULAR PLAINS
88	40	4	18	1	3	AU	2272000.00	ACRES	CENTRAL IRREGULAR PLAINS
89	40	5	18	1	1	AU	2272000.00	ACRES	CENTRAL IRREGULAR PLAINS
90	40	6	18	1	5	AU	2272000.00	ACRES	CENTRAL IRREGULAR PLAINS
91	40	7	18	1	3	AU	2272000.00	ACRES	CENTRAL IRREGULAR PLAINS
92	39	1	18	0	1	AU	1088000.00	ACRES	OZARK HIGHLANDS
93	39	2	18	0	0	AU	1088000.00	ACRES	OZARK HIGHLANDS
94	39	3	18	1	3	AU	1088000.00	ACRES	OZARK HIGHLANDS
95	39	4	18	1	3	AU	1088000.00	ACRES	OZARK HIGHLANDS
96	39	5	18	1	1	AU	1088000.00	ACRES	OZARK HIGHLANDS
97	39	6	18	1	2	AU	1088000.00	ACRES	OZARK HIGHLANDS
98	39	7	18	1	2	AU	1088000.00	ACRES	OZARK HIGHLANDS
99	38	1	18	0	1	AU	576000.00	ACRES	BOSTON MOUNTAINS
100	38	2	18	0	0	AU	576000.00	ACRES	BOSTON MOUNTAINS
101	38	3	18	1	3	AU	576000.00	ACRES	BOSTON MOUNTAINS
102	38	4	18	1	3	AU	576000.00	ACRES	BOSTON MOUNTAINS
103	38	5	18	1	1	AU	576000.00	ACRES	BOSTON MOUNTAINS
104	38	6	18	1	3	AU	576000.00	ACRES	BOSTON MOUNTAINS
105	38	7	18	1	2	AU	576000.00	ACRES	BOSTON MOUNTAINS
106	37	1	18	0	1	AU	864000.00	ACRES	ARKANSAS VALLEY
107	37	2	18	0	0	AU	864000.00	ACRES	ARKANSAS VALLEY
108	37	3	18	1	2	AU	864000.00	ACRES	ARKANSAS VALLEY
109	37	4	18	1	3	AU	764000.00	ACRES	ARKANSAS VALLEY
110	37	5	18	1	1	AU	864000.00	ACRES	ARKANSAS VALLEY
111	37	6	18	1	2	AU	864000.00	ACRES	ARKANSAS VALLEY
112	37	7	18	1	1	AU	864000.00	ACRES	ARKANSAS VALLEY
113	36	1	18	0	2	AU	2080000.00	ACRES	OUACHITA MOUNTAINS
114	36	2	18	0	0	AU	2080000.00	ACRES	OUACHITA MOUNTAINS
115	36	3	18	1	3	AU	2080000.00	ACRES	OUACHITA MOUNTAINS
116	36	4	18	1	4	AU	2080000.00	ACRES	OUACHITA MOUNTAINS
117	36	5	18	1	1	AU	2080000.00	ACRES	OUACHITA MOUNTAINS
118	36	6	18	1	3	AU	2080000.00	ACRES	OUACHITA MOUNTAINS
119	36	7	18	1	2	AU	2080000.00	ACRES	OUACHITA MOUNTAINS
120	35	1	18	0	2	AU	4640000.00	ACRES	SOUTH CENTRAL PLAINS
121	35	2	18	0	0	AU	4640000.00	ACRES	SOUTH CENTRAL PLAINS
122	35	3	18	1	3	AU	4640000.00	ACRES	SOUTH CENTRAL PLAINS
123	35	4	18	1	4	AU	4640000.00	ACRES	SOUTH CENTRAL PLAINS
124	35	5	18	1	1	AU	4640000.00	ACRES	SOUTH CENTRAL PLAINS
125	35	6	18	1	2	AU	4640000.00	ACRES	SOUTH CENTRAL PLAINS
126	35	7	18	1	2	AU	4640000.00	ACRES	SOUTH CENTRAL PLAINS
127	73	1	18	0	1	AU	5120000.00	ACRES	MISS. ALLUVIAL PLAIN
128	73	2	18	0	0	AU	5120000.00	ACRES	MISS. ALLUVIAL PLAIN
129	73	3	18	1	2	AU	5120000.00	ACRES	MISS. ALLUVIAL PLAIN

Air Toxic

130	73	4	18	1	5 AU	5120000.00 ACRES	MISS. ALLUVIAL PLAIN
131	73	5	18	1	1 AU	5120000.00 ACRES	MISS. ALLUVIAL PLAIN
132	73	6	18	1	1 AU	5120000.00 ACRES	MISS. ALLUVIAL PLAIN
133	73	7	18	1	1 AU	5120000.00 ACRES	MISS. ALLUVIAL PLAIN

Application of Pesticides

Record#	ec	func	prob	imp	vul	scode	spval	units	substr(sitedesc,1,40)	staff
1	73	1	13	0	1	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
2	73	2	13	0	0	AU	7933800.00	ACRES	INSECTICIDES	
3	73	3	13	1	2	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
4	73	4	13	1	5	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
5	73	5	13	3	4	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
6	73	6	13	3	2	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
7	73	7	13	0	1	AU	7933800.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
8	40	1	13	0	1	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
9	40	2	13	0	0	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
10	40	3	13	1	3	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
11	40	4	13	1	3	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
12	40	5	13	3	1	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
13	40	6	13	3	5	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
14	40	7	13	0	3	AU	767200.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
15	39	1	13	0	1	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
16	39	2	13	0	0	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
17	39	3	13	1	3	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
18	39	4	13	1	3	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
19	39	5	13	3	1	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
20	39	6	13	3	2	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
21	39	7	13	0	2	AU	246400.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
22	37	1	13	0	1	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
23	37	2	13	0	0	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
24	37	3	13	1	2	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
25	37	4	13	1	3	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
26	37	5	13	3	1	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
27	37	6	13	3	2	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
28	37	7	13	0	1	AU	313900.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
29	36	1	13	0	2	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
30	36	2	13	0	0	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
31	36	3	13	1	3	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
32	36	4	13	1	4	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
33	36	5	13	3	1	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
34	36	6	13	3	3	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
35	36	7	13	0	2	AU	267700.00	ACRES	INSECTICIDES	CHAPMAN/DAVIS
36	35	1	13	0	2	AU	1392850.00	ACRES	INSECTICIDES	
37	35	2	13	0	0	AU	1392850.00	ACRES	INSECTICIDES	
38	35	3	13	1	3	AU	1392850.00	ACRES	INSECTICIDES	
39	35	4	13	1	4	AU	1392850.00	ACRES	INSECTICIDES	
40	35	5	13	3	1	AU	1392850.00	ACRES	INSECTICIDES	
41	35	6	13	3	2	AU	1392850.00	ACRES	INSECTICIDES	
42	35	7	13	0	2	AU	1392850.00	ACRES	INSECTICIDES	
43	34	1	13	0	1	AU	2695600.00	ACRES	INSECTICIDES	
44	34	2	13	0	0	AU	2695600.00	ACRES	INSECTICIDES	
45	34	3	13	1	2	AU	2695600.00	ACRES	INSECTICIDES	
46	34	4	13	1	4	AU	2695600.00	ACRES	INSECTICIDES	
47	34	5	13	3	1	AU	2695600.00	ACRES	INSECTICIDES	
48	34	6	13	3	2	AU	2695600.00	ACRES	INSECTICIDES	
49	34	7	13	0	3	AU	2695600.00	ACRES	INSECTICIDES	
50	33	1	13	0	2	AU	1105000.00	ACRES	INSECTICIDES	
51	33	2	13	0	0	AU	1105000.00	ACRES	INSECTICIDES	
52	33	3	13	1	2	AU	1105000.00	ACRES	INSECTICIDES	
53	33	4	13	1	4	AU	1105000.00	ACRES	INSECTICIDES	
54	33	5	13	3	1	AU	1105000.00	ACRES	INSECTICIDES	
55	33	6	13	3	2	AU	1105000.00	ACRES	INSECTICIDES	
56	33	7	13	0	3	AU	1105000.00	ACRES	INSECTICIDES	
57	32	1	13	0	2	AU	2423990.00	ACRES	INSECTICIDES	
58	32	2	13	0	0	AU	2423990.00	ACRES	INSECTICIDES	
59	32	3	13	1	5	AU	2423990.00	ACRES	INSECTICIDES	
60	32	4	13	1	4	AU	2423990.00	ACRES	INSECTICIDES	
61	32	5	13	3	1	AU	2423990.00	ACRES	INSECTICIDES	
62	32	6	13	3	2	AU	2423990.00	ACRES	INSECTICIDES	
63	32	7	13	0	4	AU	2423990.00	ACRES	INSECTICIDES	

Application of Pesticides

64	31	1	13	0	3 AU	1180100.00 ACRES	INSECTICIDES
65	31	2	13	0	0 AU	1180100.00 ACRES	INSECTICIDES
66	31	3	13	1	3 AU	1180100.00 ACRES	INSECTICIDES
67	31	4	13	1	3 AU	1180100.00 ACRES	INSECTICIDES
68	31	5	13	3	1 AU	1180100.00 ACRES	INSECTICIDES
69	31	6	13	3	1 AU	1180100.00 ACRES	INSECTICIDES
70	31	7	13	0	3 AU	1180100.00 ACRES	INSECTICIDES
71	30	1	13	0	3 AU	515300.00 ACRES	INSECTICIDES
72	30	2	13	0	0 AU	515300.00 ACRES	INSECTICIDES
73	30	3	13	1	3 AU	515300.00 ACRES	INSECTICIDES
74	30	4	13	1	3 AU	515300.00 ACRES	INSECTICIDES
75	30	5	13	3	1 AU	515300.00 ACRES	INSECTICIDES
76	30	6	13	3	2 AU	515300.00 ACRES	INSECTICIDES
77	30	7	13	0	3 AU	515300.00 ACRES	INSECTICIDES
78	29	1	13	0	2 AU	2996150.00 ACRES	INSECTICIDES
79	29	2	13	0	0 AU	2996150.00 ACRES	INSECTICIDES
80	29	3	13	1	2 AU	2996150.00 ACRES	INSECTICIDES
81	29	4	13	1	3 AU	2996150.00 ACRES	INSECTICIDES
82	29	5	13	3	1 AU	2996150.00 ACRES	INSECTICIDES
83	29	6	13	3	3 AU	2996150.00 ACRES	INSECTICIDES
84	29	7	13	0	4 AU	2996150.00 ACRES	INSECTICIDES
85	27	1	13	0	3 AU	9304650.00 ACRES	INSECTICIDES
86	27	2	13	0	0 AU	9304650.00 ACRES	INSECTICIDES
87	27	3	13	1	2 AU	9304650.00 ACRES	INSECTICIDES
88	27	4	13	1	3 AU	9304650.00 ACRES	INSECTICIDES
89	27	5	13	3	1 AU	9304650.00 ACRES	INSECTICIDES
90	27	6	13	3	3 AU	9304650.00 ACRES	INSECTICIDES
91	27	7	13	0	4 AU	9304650.00 ACRES	INSECTICIDES
92	26	1	13	0	3 AU	1854350.00 ACRES	INSECTICIDES
93	26	2	13	0	0 AU	1854350.00 ACRES	INSECTICIDES
94	26	3	13	1	3 AU	1854350.00 ACRES	INSECTICIDES
95	26	4	13	1	2 AU	1854350.00 ACRES	INSECTICIDES
96	26	5	13	3	1 AU	1854350.00 ACRES	INSECTICIDES
97	26	6	13	3	1 AU	1854350.00 ACRES	INSECTICIDES
98	26	7	13	0	4 AU	1854350.00 ACRES	INSECTICIDES
99	25	1	13	0	5 AU	8299300.00 ACRES	INSECTICIDES
100	25	2	13	0	0 AU	8299300.00 ACRES	INSECTICIDES
101	25	3	13	1	3 AU	8299300.00 ACRES	INSECTICIDES
102	25	4	13	1	2 AU	8299300.00 ACRES	INSECTICIDES
103	25	5	13	3	1 AU	8299300.00 ACRES	INSECTICIDES
104	25	6	13	3	1 AU	8299300.00 ACRES	INSECTICIDES
105	25	7	13	0	4 AU	8299300.00 ACRES	INSECTICIDES
106	24	1	13	0	5 AU	256100.00 ACRES	INSECTICIDES
107	24	2	13	0	0 AU	256100.00 ACRES	INSECTICIDES
108	24	3	13	1	5 AU	256100.00 ACRES	INSECTICIDES
109	24	4	13	1	1 AU	256100.00 ACRES	INSECTICIDES
110	24	5	13	3	1 AU	256100.00 ACRES	INSECTICIDES
111	24	6	13	3	4 AU	256100.00 ACRES	INSECTICIDES
112	24	7	13	0	5 AU	256100.00 ACRES	INSECTICIDES
113	73	1	13	1	1 AU	7933800.00 ACRES	HERBICIDES
114	73	2	13	3	0 AU	7933800.00 ACRES	HERBICIDES
115	73	3	13	2	2 AU	7933800.00 ACRES	HERBICIDES
116	73	4	13	1	5 AU	7933800.00 ACRES	HERBICIDES
117	73	5	13	1	4 AU	7933800.00 ACRES	HERBICIDES
118	73	6	13	3	2 AU	7933800.00 ACRES	HERBICIDES
119	73	7	13	1	1 AU	7933800.00 ACRES	HERBICIDES
120	40	1	13	1	1 AU	767200.00 ACRES	HERBICIDES
121	40	2	13	3	0 AU	767200.00 ACRES	HERBICIDES
122	40	3	13	2	3 AU	767200.00 ACRES	HERBICIDES
123	40	4	13	1	3 AU	767200.00 ACRES	HERBICIDES
124	40	5	13	1	1 AU	767200.00 ACRES	HERBICIDES
125	40	6	13	3	5 AU	767200.00 ACRES	HERBICIDES
126	40	7	13	1	3 AU	767200.00 ACRES	HERBICIDES
127	39	1	13	1	1 AU	246400.00 ACRES	HERBICIDES
128	39	2	13	3	0 AU	246400.00 ACRES	HERBICIDES
129	39	3	13	2	3 AU	246400.00 ACRES	HERBICIDES

Application of Pesticides

130	39	4	13	1	3 AU	246400.00 ACRES	HERBICIDES
131	39	5	13	1	1 AU	246400.00 ACRES	HERBICIDES
132	39	6	13	3	2 AU	246400.00 ACRES	HERBICIDES
133	39	7	13	1	2 AU	246400.00 ACRES	HERBICIDES
134	37	1	13	1	1 AU	313900.00 ACRES	HERBICIDES
135	37	2	13	3	0 AU	313900.00 ACRES	HERBICIDES
136	37	3	13	2	2 AU	313900.00 ACRES	HERBICIDES
137	37	4	13	1	3 AU	313900.00 ACRES	HERBICIDES
138	37	5	13	1	1 AU	313900.00 ACRES	HERBICIDES
139	37	6	13	3	2 AU	313900.00 ACRES	HERBICIDES
140	37	7	13	1	1 AU	313900.00 ACRES	HERBICIDES
141	36	1	13	1	2 AU	267700.00 ACRES	HERBICIDES
142	36	2	13	3	0 AU	267700.00 ACRES	HERBICIDES
143	36	3	13	2	3 AU	267700.00 ACRES	HERBICIDES
144	36	4	13	1	4 AU	267700.00 ACRES	HERBICIDES
145	36	5	13	1	1 AU	267700.00 ACRES	HERBICIDES
146	36	6	13	3	3 AU	267700.00 ACRES	HERBICIDES
147	36	7	13	1	2 AU	267700.00 ACRES	HERBICIDES
148	35	1	13	1	2 AU	1392850.00 ACRES	HERBICIDES
149	35	2	13	3	0 AU	1392850.00 ACRES	HERBICIDES
150	35	3	13	2	3 AU	1392850.00 ACRES	HERBICIDES
151	35	4	13	1	4 AU	1392850.00 ACRES	HERBICIDES
152	35	5	13	1	1 AU	1392850.00 ACRES	HERBICIDES
153	35	6	13	3	2 AU	1392850.00 ACRES	HERBICIDES
154	35	7	13	1	2 AU	1392850.00 ACRES	HERBICIDES
155	34	1	13	1	1 AU	2695600.00 ACRES	HERBICIDES
156	34	2	13	3	0 AU	2695600.00 ACRES	HERBICIDES
157	34	3	13	2	2 AU	2695600.00 ACRES	HERBICIDES
158	34	4	13	1	4 AU	2695600.00 ACRES	HERBICIDES
159	34	5	13	1	1 AU	2695600.00 ACRES	HERBICIDES
160	34	6	13	3	4 AU	2695600.00 ACRES	HERBICIDES
161	34	7	13	1	3 AU	2695600.00 ACRES	HERBICIDES
162	33	1	13	1	2 AU	1105000.00 ACRES	HERBICIDES
163	33	2	13	3	0 AU	1105000.00 ACRES	HERBICIDES
164	33	3	13	2	2 AU	1105000.00 ACRES	HERBICIDES
165	33	4	13	1	4 AU	1105000.00 ACRES	HERBICIDES
166	33	5	13	1	1 AU	1105000.00 ACRES	HERBICIDES
167	33	6	13	3	2 AU	1105000.00 ACRES	HERBICIDES
168	33	7	13	1	3 AU	1105000.00 ACRES	HERBICIDES
169	32	1	13	1	2 AU	2423990.00 ACRES	HERBICIDES
170	32	2	13	3	0 AU	2423990.00 ACRES	HERBICIDES
171	32	3	13	2	2 AU	2423990.00 ACRES	HERBICIDES
172	32	4	13	1	4 AU	2423990.00 ACRES	HERBICIDES
173	32	5	13	1	1 AU	2423990.00 ACRES	HERBICIDES
174	32	6	13	3	2 AU	2423990.00 ACRES	HERBICIDES
175	32	7	13	1	4 AU	2423990.00 ACRES	HERBICIDES
176	31	1	13	1	3 AU	1180100.00 ACRES	HERBICIDES
177	31	2	13	3	0 AU	1180100.00 ACRES	HERBICIDES
178	31	3	13	2	3 AU	1180100.00 ACRES	HERBICIDES
179	31	4	13	1	3 AU	1180100.00 ACRES	HERBICIDES
180	31	5	13	1	1 AU	1180100.00 ACRES	HERBICIDES
181	31	6	13	3	1 AU	1180100.00 ACRES	HERBICIDES
182	31	7	13	1	3 AU	1180100.00 ACRES	HERBICIDES
183	30	1	13	1	3 AU	515300.00 ACRES	HERBICIDES
184	30	2	13	3	0 AU	515300.00 ACRES	HERBICIDES
185	30	3	13	2	3 AU	515300.00 ACRES	HERBICIDES
186	30	4	13	1	3 AU	515300.00 ACRES	HERBICIDES
187	30	5	13	1	1 AU	515300.00 ACRES	HERBICIDES
188	30	6	13	3	2 AU	515300.00 ACRES	HERBICIDES
189	30	7	13	1	3 AU	515300.00 ACRES	HERBICIDES
190	29	1	13	1	2 AU	2996150.00 ACRES	HERBICIDES
191	29	2	13	3	0 AU	2996150.00 ACRES	HERBICIDES
192	29	3	13	2	2 AU	2996150.00 ACRES	HERBICIDES
193	29	4	13	1	3 AU	2996150.00 ACRES	HERBICIDES
194	29	5	13	1	1 AU	2996150.00 ACRES	HERBICIDES
195	29	6	13	3	3 AU	2996150.00 ACRES	HERBICIDES

Application of Pesticides

196	29	7	13	1	4 AU	2996150.00 ACRES	HERBICIDES
197	27	1	13	1	3 AU	9304650.00 ACRES	HERBICIDES
198	27	2	13	3	0 AU	9304650.00 ACRES	HERBICIDES
199	27	3	13	2	2 AU	9304650.00 ACRES	HERBICIDES
200	27	4	13	1	3 AU	9304650.00 ACRES	HERBICIDES
201	27	5	13	1	1 AU	9304650.00 ACRES	HERBICIDES
202	27	6	13	3	3 AU	9304650.00 ACRES	HERBICIDES
203	27	7	13	1	4 AU	9304650.00 ACRES	HERBICIDES
204	26	1	13	1	3 AU	1854350.00 ACRES	HERBICIDES
205	26	2	13	3	0 AU	1854350.00 ACRES	HERBICIDES
206	26	3	13	2	3 AU	1854350.00 ACRES	HERBICIDES
207	26	4	13	1	2 AU	1854350.00 ACRES	HERBICIDES
208	26	5	13	1	1 AU	1854350.00 ACRES	HERBICIDES
209	26	6	13	3	1 AU	1854350.00 ACRES	HERBICIDES
210	26	7	13	1	4 AU	1854350.00 ACRES	HERBICIDES
211	25	1	13	1	5 AU	8299300.00 ACRES	HERBICIDES
212	25	2	13	3	0 AU	8299300.00 ACRES	HERBICIDES
213	25	3	13	2	3 AU	8299300.00 ACRES	HERBICIDES
214	25	4	13	1	2 AU	8299300.00 ACRES	HERBICIDES
215	25	5	13	1	1 AU	8299300.00 ACRES	HERBICIDES
216	25	6	13	3	1 AU	8299300.00 ACRES	HERBICIDES
217	25	7	13	1	4 AU	8299300.00 ACRES	HERBICIDES
218	24	1	13	1	5 AU	256100.00 ACRES	HERBICIDES
219	24	2	13	3	0 AU	256100.00 ACRES	HERBICIDES
220	24	3	13	2	5 AU	256100.00 ACRES	HERBICIDES
221	24	4	13	1	1 AU	256100.00 ACRES	HERBICIDES
222	24	5	13	1	1 AU	256100.00 ACRES	HERBICIDES
223	24	6	13	3	4 AU	256100.00 ACRES	HERBICIDES
224	24	7	13	1	5 AU	256100.00 ACRES	HERBICIDES

CERCLA Hazards Waste Sites

Record#	ec	func	prob	imp	vul	scode	spval units	substr(sitedesc,1,40)	staff
1	37	1	9	0	1	AU	8.00 ACRES		
2	37	2	9	0	0	AU	8.00 ACRES		
3	37	3	9	4	2	AU	8.00 ACRES		
4	37	4	9	4	3	AU	8.00 ACRES		
5	37	5	9	4	1	AU	8.00 ACRES		
6	37	6	9	4	2	AU	8.00 ACRES		
7	37	7	9	4	1	AU	8.00 ACRES		
8	37	1	9	0	1	AU	2001.00 ACRES		
9	37	2	9	0	0	AU	2001.00 ACRES		
10	37	3	9	1	2	AU	2001.00 ACRES		
11	37	4	9	1	3	AU	2001.00 ACRES		
12	37	5	9	1	1	AU	2001.00 ACRES		
13	37	6	9	1	2	AU	2001.00 ACRES		
14	37	7	9	1	1	AU	2001.00 ACRES		
15	39	1	9	0	1	AU	48.00 ACRES		
16	39	2	9	0	0	AU	48.00 ACRES		
17	39	3	9	4	3	AU	48.00 ACRES		
18	39	4	9	4	3	AU	48.00 ACRES		
19	39	5	9	4	1	AU	48.00 ACRES		
20	39	6	9	4	3	AU	48.00 ACRES		
21	39	7	9	4	2	AU	48.00 ACRES		
22	39	1	9	0	1	AU	3970.00 ACRES		
23	39	2	9	0	0	AU	3970.00 ACRES		
24	39	3	9	1	0	AU	3970.00 ACRES		
25	39	4	9	1	3	AU	3970.00 ACRES		
26	39	5	9	1	1	AU	3970.00 ACRES		
27	39	6	9	1	3	AU	3970.00 ACRES		
28	39	7	9	1	2	AU	3970.00 ACRES		
29	36	1	9	0	2	AU	224.00 ACRES		
30	36	2	9	0	0	AU	224.00 ACRES		
31	36	3	9	4	3	AU	224.00 ACRES		
32	36	4	9	4	4	AU	224.00 ACRES		
33	36	5	9	4	1	AU	224.00 ACRES		
34	36	6	9	4	3	AU	224.00 ACRES		
35	36	7	9	4	2	AU	224.00 ACRES		
36	36	1	9	0	2	AU	7859.00 ACRES		
37	36	2	9	0	0	AU	7859.00 ACRES		
38	36	3	9	1	3	AU	7859.00 ACRES		
39	36	4	9	1	4	AU	7859.00 ACRES		
40	36	5	9	1	1	AU	7859.00 ACRES		
41	36	6	9	1	3	AU	7859.00 ACRES		
42	36	7	9	1	2	AU	7859.00 ACRES		
43	35	1	9	0	2	AU	8931.00 ACRES		
44	35	2	9	0	0	AU	8931.00 ACRES		
45	35	3	9	4	3	AU	8931.00 ACRES		
46	35	4	9	4	4	AU	8931.00 ACRES		
47	35	5	9	4	1	AU	8931.00 ACRES		
48	35	6	9	4	2	AU	8931.00 ACRES		
49	35	7	9	4	2	AU	8931.00 ACRES		
50	35	1	9	0	2	AU	9843.00 ACRES		
51	35	2	9	0	0	AU	9843.00 ACRES		
52	35	3	9	1	3	AU	9843.00 ACRES		
53	35	4	9	1	4	AU	9843.00 ACRES		
54	35	5	9	1	1	AU	9843.00 ACRES		
55	35	6	9	1	2	AU	9843.00 ACRES		
56	35	7	9	1	2	AU	9843.00 ACRES		
57	34	1	9	0	1	AU	545.40 ACRES		
58	34	2	9	0	0	AU	545.40 ACRES		
59	34	3	9	4	2	AU	545.40 ACRES		
60	34	4	9	4	4	AU	545.40 ACRES		
61	34	5	9	4	1	AU	545.40 ACRES		
62	34	6	9	4	2	AU	545.40 ACRES		
63	34	7	9	4	3	AU	545.40 ACRES		

CERCLA Hazards Waste Sites

64	34	1	9	0	1 AU	27574.70 ACRES
65	34	2	9	0	0 AU	27574.70 ACRES
66	34	3	9	1	2 AU	27574.70 ACRES
67	34	4	9	1	4 AU	27574.70 ACRES
68	34	5	9	1	1 AU	27574.70 ACRES
69	34	6	9	1	2 AU	27574.70 ACRES
70	34	7	9	1	3 AU	27574.70 ACRES
71	65	1	9	0	1 AU	52.00 ACRES
72	65	2	9	0	0 AU	52.00 ACRES
73	65	3	9	4	2 AU	52.00 ACRES
74	65	4	9	4	5 AU	52.00 ACRES
75	65	5	9	4	1 AU	52.00 ACRES
76	65	6	9	4	4 AU	52.00 ACRES
77	65	7	9	4	2 AU	52.00 ACRES
78	65	1	9	0	1 AU	1957.00 ACRES
79	65	2	9	0	0 AU	1957.00 ACRES
80	65	3	9	1	2 AU	1957.00 ACRES
81	65	4	9	1	5 AU	1957.00 ACRES
82	65	5	9	1	1 AU	1957.00 ACRES
83	65	6	9	1	4 AU	1957.00 ACRES
84	65	7	9	1	2 AU	1957.00 ACRES
85	73	1	9	0	1 AU	412.00 ACRES
86	73	2	9	0	0 AU	412.00 ACRES
87	73	3	9	4	2 AU	412.00 ACRES
88	73	4	9	4	5 AU	412.00 ACRES
89	73	5	9	4	1 AU	412.00 ACRES
90	73	6	9	4	1 AU	412.00 ACRES
91	73	7	9	4	1 AU	412.00 ACRES
92	73	1	9	0	1 AU	19678.00 ACRES
93	73	2	9	0	0 AU	19678.00 ACRES
94	73	3	9	1	2 AU	19678.00 ACRES
95	73	4	9	1	5 AU	19678.00 ACRES
96	73	5	9	1	1 AU	19678.00 ACRES
97	73	6	9	1	1 AU	19678.00 ACRES
98	73	7	9	1	1 AU	19678.00 ACRES
99	22	1	9	0	4 AU	1170.25 ACRES
100	22	2	9	0	0 AU	1170.25 ACRES
101	22	3	9	4	5 AU	1170.25 ACRES
102	22	4	9	4	1 AU	1170.25 ACRES
103	22	5	9	4	2 AU	1170.25 ACRES
104	22	6	9	4	4 AU	1170.25 ACRES
105	22	7	9	4	5 AU	1170.25 ACRES
106	22	1	9	0	4 AU	12892.75 ACRES
107	22	2	9	0	0 AU	12892.75 ACRES
108	22	3	9	1	5 AU	12892.75 ACRES
109	22	4	9	1	1 AU	12892.75 ACRES
110	22	5	9	1	2 AU	12892.75 ACRES
111	22	6	9	1	4 AU	12892.75 ACRES
112	22	7	9	1	5 AU	12892.75 ACRES
113	23	1	9	0	4 AU	8.50 ACRES
114	23	2	9	0	0 AU	8.50 ACRES
115	23	3	9	4	5 AU	8.50 ACRES
116	23	4	9	4	1 AU	8.50 ACRES
117	23	5	9	4	5 AU	8.50 ACRES
118	23	6	9	4	5 AU	8.50 ACRES
119	23	7	9	4	3 AU	8.50 ACRES
120	23	1	9	0	4 AU	4000.50 ACRES
121	23	2	9	0	0 AU	4000.50 ACRES
122	23	3	9	1	5 AU	4000.50 ACRES
123	23	4	9	1	1 AU	4000.50 ACRES
124	23	5	9	1	5 AU	4000.50 ACRES
125	23	6	9	1	5 AU	4000.50 ACRES
126	23	7	9	1	3 AU	4000.50 ACRES
127	29	1	9	0	2 AU	315.40 ACRES
128	29	2	9	0	0 AU	315.40 ACRES
129	29	3	9	4	2 AU	315.40 ACRES

CERCLA Hazards Waste Sites

130	29	4	9	4	3 AU	315.40 ACRES
131	29	5	9	4	1 AU	315.40 ACRES
132	29	6	9	4	3 AU	315.40 ACRES
133	29	7	9	4	4 AU	315.40 ACRES
134	29	1	9	0	2 AU	7929.60 ACRES
135	29	2	9	0	0 AU	7929.60 ACRES
136	29	3	9	1	2 AU	7929.60 ACRES
137	29	4	9	1	3 AU	7929.60 ACRES
138	29	5	9	1	1 AU	7929.60 ACRES
139	29	6	9	1	3 AU	7929.60 ACRES
140	29	7	9	1	4 AU	7929.60 ACRES
141	40	1	9	0	1 AU	17066.00 ACRES
142	40	2	9	0	0 AU	17066.00 ACRES
143	40	3	9	4	3 AU	17066.00 ACRES
144	40	4	9	4	3 AU	17066.00 ACRES
145	40	5	9	4	1 AU	17066.00 ACRES
146	40	6	9	4	5 AU	17066.00 ACRES
147	40	7	9	4	3 AU	17066.00 ACRES
148	25	1	9	0	5 AU	25.00 ACRES
149	25	2	9	0	0 AU	25.00 ACRES
150	25	3	9	4	3 AU	25.00 ACRES
151	25	4	9	4	2 AU	25.00 ACRES
152	25	5	9	4	1 AU	25.00 ACRES
153	25	6	9	4	1 AU	25.00 ACRES
154	25	7	9	4	4 AU	25.00 ACRES
155	25	1	9	0	5 AU	3995.00 ACRES
156	25	2	9	0	0 AU	3995.00 ACRES
157	25	3	9	1	3 AU	3995.00 ACRES
158	25	4	9	1	2 AU	3995.00 ACRES
159	25	5	9	1	1 AU	3995.00 ACRES
160	25	6	9	1	1 AU	3995.00 ACRES
161	25	7	9	1	4 AU	3995.00 ACRES
162	27	1	9	0	3 AU	8875.00 ACRES
163	27	2	9	0	0 AU	8875.00 ACRES
164	27	3	9	4	2 AU	8875.00 ACRES
165	27	4	9	4	3 AU	8875.00 ACRES
166	27	5	9	4	1 AU	8875.00 ACRES
167	27	6	9	4	3 AU	8875.00 ACRES
168	27	7	9	4	4 AU	8875.00 ACRES
169	27	1	9	0	3 AU	9703.00 ACRES
170	27	2	9	0	0 AU	9703.00 ACRES
171	27	3	9	1	2 AU	9703.00 ACRES
172	27	4	9	1	3 AU	9703.00 ACRES
173	27	5	9	1	1 AU	9703.00 ACRES
174	27	6	9	1	3 AU	9703.00 ACRES
175	27	7	9	1	4 AU	9703.00 ACRES
176	33	1	9	0	2 AU	55.00 ACRES
177	33	2	9	0	0 AU	55.00 ACRES
178	33	3	9	4	2 AU	55.00 ACRES
179	33	4	9	4	4 AU	55.00 ACRES
180	33	5	9	4	1 AU	55.00 ACRES
181	33	6	9	4	2 AU	55.00 ACRES
182	33	7	9	4	3 AU	55.00 ACRES
183	33	1	9	0	2 AU	1954.00 ACRES
184	33	2	9	0	0 AU	1954.00 ACRES
185	33	3	9	1	2 AU	1954.00 ACRES
186	33	4	9	1	4 AU	1954.00 ACRES
187	33	5	9	1	1 AU	1954.00 ACRES
188	33	6	9	1	2 AU	1954.00 ACRES
189	33	7	9	1	3 AU	1954.00 ACRES

Industrial Point Discharges to Surface Waters

Record#	ec	func	prob	imp	vul	scode	spval	units	substr(sitedesc,1,40)	staff
1	37	1	1	0	1	LU	8.00	MILES	ARKANSAS VALLEY	
2	37	2	1	0	0	LU	8.00	MILES	ARKANSAS VALLEY	
3	37	3	1	3	2	LU	8.00	MILES	ARKANSAS VALLEY	
4	37	4	1	0	3	LU	8.00	MILES	ARKANSAS VALLEY	
5	37	5	1	3	1	LU	8.00	MILES	ARKANSAS VALLEY	
6	37	6	1	1	2	LU	8.00	MILES	ARKANSAS VALLEY	
7	37	7	1	1	1	LU	8.00	MILES	ARKANSAS VALLEY	
8	40	1	1	0	1	LU	55.90	MILES	CENTRAL IRREGULAR PLAINS	
9	40	2	1	0	0	LU	55.90	MILES	CENTRAL IRREGULAR PLAINS	
10	40	3	1	3	3	LU	55.90	MILES	CENTRAL IRREGULAR PLAINS	
11	40	4	1	0	3	LU	55.90	MILES	CENTRAL IRREGULAR PLAINS	
12	40	5	1	1	1	LU	55.90	MILES	CENTRAL IRREGULAR PLAINS	
13	40	6	1	1	5	LU	55.90	MILES	CENTRAL IRREGULAR PLAINS	
14	40	7	1	1	3	LU	55.90	MILES	CENTRAL IRREGULAR PLAINS	
15	73	1	1	0	1	LU	75.00	MILES	MISS. ALLUVIAL PLAIN	
16	73	2	1	0	0	LU	75.00	MILES	MISS. ALLUVIAL PLAIN	
17	73	3	1	3	2	LU	75.00	MILES	MISS. ALLUVIAL PLAIN	
18	73	4	1	0	5	LU	75.00	MILES	MISS. ALLUVIAL PLAIN	
19	73	5	1	3	1	LU	75.00	MILES	MISS. ALLUVIAL PLAIN	
20	73	6	1	1	1	LU	75.00	MILES	MISS. ALLUVIAL PLAIN	
21	73	7	1	1	1	LU	75.00	MILES	MISS. ALLUVIAL PLAIN	
22	73	1	1	0	1	LU	497.00	MILES	MISS. ALLUVIAL PLAIN	
23	73	2	1	0	0	LU	497.00	MILES	MISS. ALLUVIAL PLAIN	
24	73	3	1	3	2	LU	497.00	MILES	MISS. ALLUVIAL PLAIN	
25	73	4	1	0	5	LU	497.00	MILES	MISS. ALLUVIAL PLAIN	
26	73	5	1	3	1	LU	497.00	MILES	MISS. ALLUVIAL PLAIN	
27	73	6	1	1	1	LU	497.00	MILES	MISS. ALLUVIAL PLAIN	
28	73	7	1	1	1	LU	497.00	MILES	MISS. ALLUVIAL PLAIN	
29	27	1	1	0	3	LU	40.70	MILES	CENTRAL GREAT PLAINS	
30	27	2	1	0	0	LU	40.70	MILES	CENTRAL GREAT PLAINS	
31	27	3	1	3	2	LU	40.70	MILES	CENTRAL GREAT PLAINS	
32	27	4	1	0	3	LU	40.70	MILES	CENTRAL GREAT PLAINS	
33	27	5	1	1	1	LU	40.70	MILES	CENTRAL GREAT PLAINS	
34	27	6	1	1	3	LU	40.70	MILES	CENTRAL GREAT PLAINS	
35	27	7	1	1	4	LU	40.70	MILES	CENTRAL GREAT PLAINS	
36	27	1	1	0	3	LU	15.00	MILES	CENTRAL GREAT PLAINS	
37	27	2	1	0	0	LU	15.00	MILES	CENTRAL GREAT PLAINS	
38	27	3	1	3	2	LU	15.00	MILES	CENTRAL GREAT PLAINS	
39	27	4	1	0	3	LU	15.00	MILES	CENTRAL GREAT PLAINS	
40	27	5	1	3	1	LU	15.00	MILES	CENTRAL GREAT PLAINS	
41	27	6	1	1	3	LU	15.00	MILES	CENTRAL GREAT PLAINS	
42	27	7	1	1	4	LU	15.00	MILES	CENTRAL GREAT PLAINS	
43	29	1	1	0	2	LU	32.50	MILES	CENTRAL OK/TEXAS	
44	29	2	1	0	0	LU	32.50	MILES	CENTRAL OK/TEXAS	
45	29	3	1	3	2	LU	32.50	MILES	CENTRAL OK/TEXAS	
46	29	4	1	0	3	LU	32.50	MILES	CENTRAL OK/TEXAS	
47	29	5	1	1	1	LU	32.50	MILES	CENTRAL OK/TEXAS	
48	29	6	1	1	3	LU	32.50	MILES	CENTRAL OK/TEXAS	
49	29	7	1	1	4	LU	32.50	MILES	CENTRAL OK/TEXAS	
50	35	1	1	0	2	LU	132.90	MILES	SOUTH CENTRAL PLAINS	
51	35	2	1	0	0	LU	132.90	MILES	SOUTH CENTRAL PLAINS	
52	35	3	1	3	3	LU	132.90	MILES	SOUTH CENTRAL PLAINS	
53	35	4	1	0	4	LU	132.90	MILES	SOUTH CENTRAL PLAINS	
54	35	5	1	1	1	LU	132.90	MILES	SOUTH CENTRAL PLAINS	
55	35	6	1	1	2	LU	132.90	MILES	SOUTH CENTRAL PLAINS	
56	35	7	1	1	2	LU	132.90	MILES	SOUTH CENTRAL PLAINS	
57	35	1	1	0	2	LU	130.50	MILES	SOUTH CENTRAL PLAINS	
58	35	2	1	0	0	LU	130.50	MILES	SOUTH CENTRAL PLAINS	
59	35	3	1	3	3	LU	130.50	MILES	SOUTH CENTRAL PLAINS	
60	35	4	1	0	4	LU	130.50	MILES	SOUTH CENTRAL PLAINS	
61	35	5	1	3	1	LU	130.50	MILES	SOUTH CENTRAL PLAINS	
62	35	6	1	1	2	LU	130.50	MILES	SOUTH CENTRAL PLAINS	
63	35	7	1	1	2	LU	130.50	MILES	SOUTH CENTRAL PLAINS	

Industrial Point Discharges to Surface Waters

64	65	1	1	0	1 LU	56.00 MILES
65	65	2	1	0	0 LU	56.00 MILES
66	65	3	1	3	2 LU	56.00 MILES
67	65	4	1	0	3 LU	56.00 MILES
68	65	5	1	1	1 LU	56.00 MILES
69	65	6	1	1	1 LU	56.00 MILES
70	65	7	1	1	1 LU	56.00 MILES
71	65	1	1	0	1 LU	13.00 MILES
72	65	2	1	0	0 LU	13.00 MILES
73	65	3	1	3	2 LU	13.00 MILES
74	65	4	1	0	5 LU	13.00 MILES
75	65	5	1	3	1 LU	13.00 MILES
76	65	6	1	1	1 LU	13.00 MILES
77	65	7	1	1	1 LU	13.00 MILES
78	74	1	1	0	1 LU	25.00 MILES
79	74	2	1	0	0 LU	25.00 MILES
80	74	3	1	3	2 LU	25.00 MILES
81	74	4	1	0	5 LU	25.00 MILES
82	74	5	1	1	1 LU	25.00 MILES
83	74	6	1	1	1 LU	25.00 MILES
84	74	7	1	1	2 LU	25.00 MILES
85	74	1	1	0	1 LU	10.00 MILES
86	74	2	1	0	0 LU	10.00 MILES
87	74	3	1	3	2 LU	10.00 MILES
88	74	4	1	0	5 LU	10.00 MILES
89	74	5	1	3	1 LU	10.00 MILES
90	74	6	1	1	1 LU	10.00 MILES
91	74	7	1	1	2 LU	10.00 MILES
92	33	1	1	0	2 LU	130.00 MILES
93	33	2	1	0	0 LU	130.00 MILES
94	33	3	1	3	2 LU	130.00 MILES
95	33	4	1	0	4 LU	130.00 MILES
96	33	5	1	1	1 LU	130.00 MILES
97	33	6	1	1	2 LU	130.00 MILES
98	33	7	1	1	3 LU	130.00 MILES
99	34	1	1	0	1 LU	98.00 MILES
100	34	2	1	0	0 LU	98.00 MILES
101	34	3	1	3	2 LU	98.00 MILES
102	34	4	1	0	4 LU	98.00 MILES
103	34	5	1	1	1 LU	98.00 MILES
104	34	6	1	1	2 LU	98.00 MILES
105	34	7	1	1	3 LU	98.00 MILES
106	34	1	1	0	1 LU	433.00 MILES
107	34	2	1	0	0 LU	433.00 MILES
108	34	3	1	3	2 LU	433.00 MILES
109	34	4	1	0	4 LU	433.00 MILES
110	34	5	1	3	1 LU	433.00 MILES
111	34	6	1	1	2 LU	433.00 MILES
112	34	7	1	1	3 LU	433.00 MILES
113	34	1	1	0	1 LU	15.00 MILES
114	34	2	1	0	0 LU	15.00 MILES
115	34	3	1	3	2 LU	15.00 MILES
116	34	4	1	0	4 LU	15.00 MILES
117	34	5	1	2	1 LU	15.00 MILES
118	34	6	1	1	2 LU	15.00 MILES
119	34	7	1	1	3 LU	15.00 MILES

Non-Point Source Discharges

Record#	ec	func	prob	imp	vul	scode	spval	units	substr(sitedesc,1,40)	staff
1	39	1	4	0	1	LU	2.50	MILES	OZARK HIGHLANDS	
2	39	2	4	0	0	LU	2.50	MILES	OZARK HIGHLANDS	
3	39	3	4	3	3	LU	2.50	MILES	OZARK HIGHLANDS	
4	39	4	4	0	3	LU	2.50	MILES	OZARK HIGHLANDS	
5	39	5	4	1	1	LU	2.50	MILES	OZARK HIGHLANDS	
6	39	6	4	1	2	LU	2.50	MILES	OZARK HIGHLANDS	
7	39	7	4	1	2	LU	2.50	MILES	OZARK HIGHLANDS	
8	40	1	4	0	1	LU	149.60	MILES	CENTRAL IRREGULAR PLAINS	
9	40	2	4	0	0	LU	149.60	MILES	CENTRAL IRREGULAR PLAINS	
10	40	3	4	3	3	LU	149.60	MILES	CENTRAL IRREGULAR PLAINS	
11	40	4	4	0	3	LU	149.60	MILES	CENTRAL IRREGULAR PLAINS	
12	40	5	4	1	1	LU	149.60	MILES	CENTRAL IRREGULAR PLAINS	
13	40	6	4	1	5	LU	149.60	MILES	CENTRAL IRREGULAR PLAINS	
14	40	7	4	1	3	LU	149.60	MILES	CENTRAL IRREGULAR PLAINS	
15	40	1	4	0	1	LU	32.30	MILES	CENTRAL IRREGULAR PLAINS	
16	40	2	4	0	0	LU	32.30	MILES	CENTRAL IRREGULAR PLAINS	
17	40	3	4	3	3	LU	32.30	MILES	CENTRAL IRREGULAR PLAINS	
18	40	4	4	0	3	LU	32.30	MILES	CENTRAL IRREGULAR PLAINS	
19	40	5	4	3	1	LU	32.30	MILES	CENTRAL IRREGULAR PLAINS	
20	40	6	4	1	5	LU	32.30	MILES	CENTRAL IRREGULAR PLAINS	
21	40	7	4	1	3	LU	32.30	MILES	CENTRAL IRREGULAR PLAINS	
22	73	1	4	0	1	LU	2539.90	MILES	MISS. ALLUVIAL PLAIN	
23	73	2	4	0	0	LU	2539.90	MILES	MISS. ALLUVIAL PLAIN	
24	73	3	4	3	2	LU	2539.90	MILES	MISS. ALLUVIAL PLAIN	
25	73	4	4	0	5	LU	2539.90	MILES	MISS. ALLUVIAL PLAIN	
26	73	5	4	1	1	LU	2539.90	MILES	MISS. ALLUVIAL PLAIN	
27	73	6	4	1	1	LU	2539.90	MILES	MISS. ALLUVIAL PLAIN	
28	73	7	4	1	1	LU	2539.90	MILES	MISS. ALLUVIAL PLAIN	
29	73	1	4	0	1	LU	398.00	MILES	MISS. ALLUVIAL PLAIN	
30	73	2	4	0	0	LU	398.00	MILES	MISS. ALLUVIAL PLAIN	
31	73	3	4	3	2	LU	398.00	MILES	MISS. ALLUVIAL PLAIN	
32	73	4	4	0	5	LU	398.00	MILES	MISS. ALLUVIAL PLAIN	
33	73	5	4	3	1	LU	398.00	MILES	MISS. ALLUVIAL PLAIN	
34	73	6	4	1	1	LU	398.00	MILES	MISS. ALLUVIAL PLAIN	
35	73	7	4	1	1	LU	398.00	MILES	MISS. ALLUVIAL PLAIN	
36	24	1	4	0	5	LU	338.60	MILES	SOUTHERN DESERTS	
37	24	2	4	0	0	LU	338.60	MILES	SOUTHERN DESERTS	
38	24	3	4	3	5	LU	338.60	MILES	SOUTHERN DESERTS	
39	24	4	4	0	1	LU	338.60	MILES	SOUTHERN DESERTS	
40	24	5	4	1	1	LU	338.60	MILES	SOUTHERN DESERTS	
41	24	6	4	1	4	LU	338.60	MILES	SOUTHERN DESERTS	
42	24	7	4	1	5	LU	338.60	MILES	SOUTHERN DESERTS	
43	25	1	4	0	5	LU	92.70	MILES	WESTERN HIGH PLAINS	
44	25	2	4	0	0	LU	92.70	MILES	WESTERN HIGH PLAINS	
45	25	3	4	3	3	LU	92.70	MILES	WESTERN HIGH PLAINS	
46	25	4	4	0	2	LU	92.70	MILES	WESTERN HIGH PLAINS	
47	25	5	4	3	1	LU	92.70	MILES	WESTERN HIGH PLAINS	
48	25	6	4	1	1	LU	92.70	MILES	WESTERN HIGH PLAINS	
49	25	7	4	1	4	LU	92.70	MILES	WESTERN HIGH PLAINS	
50	26	1	4	0	3	LU	434.00	MILES	SOUTHWESTERN TABLELANDS	
51	26	2	4	0	0	LU	434.00	MILES	SOUTHWESTERN TABLELANDS	
52	26	3	4	3	3	LU	434.00	MILES	SOUTHWESTERN TABLELANDS	
53	26	4	4	0	2	LU	434.00	MILES	SOUTHWESTERN TABLELANDS	
54	26	5	4	1	1	LU	434.00	MILES	SOUTHWESTERN TABLELANDS	
55	26	6	4	1	1	LU	434.00	MILES	SOUTHWESTERN TABLELANDS	
56	26	7	4	1	4	LU	434.00	MILES	SOUTHWESTERN TABLELANDS	
57	26	1	4	0	3	LU	39.00	MILES	SOUTHWESTERN TABLELANDS	
58	26	2	4	0	0	LU	39.00	MILES	SOUTHWESTERN TABLELANDS	
59	26	3	4	3	3	LU	39.00	MILES	SOUTHWESTERN TABLELANDS	
60	26	4	4	0	2	LU	39.00	MILES	SOUTHWESTERN TABLELANDS	
61	26	5	4	3	1	LU	39.00	MILES	SOUTHWESTERN TABLELANDS	
62	26	6	4	1	1	LU	39.00	MILES	SOUTHWESTERN TABLELANDS	
63	26	7	4	1	4	LU	39.00	MILES	SOUTHWESTERN TABLELANDS	

Non-Point Source Discharges

64	27	1	4	0	3 LU	767.90 MILES	CENTRAL GREAT PLAINS
65	27	2	4	0	0 LU	767.90 MILES	CENTRAL GREAT PLAINS
66	27	3	4	3	2 LU	767.90 MILES	CENTRAL GREAT PLAINS
67	27	4	4	0	3 LU	767.90 MILES	CENTRAL GREAT PLAINS
68	27	5	4	1	1 LU	767.90 MILES	CENTRAL GREAT PLAINS
69	27	6	4	1	3 LU	767.90 MILES	CENTRAL GREAT PLAINS
70	27	7	4	1	4 LU	767.90 MILES	CENTRAL GREAT PLAINS
71	27	1	4	0	3 LU	9.90 MILES	CENTRAL GREAT PLAINS
72	27	2	4	0	0 LU	9.90 MILES	CENTRAL GREAT PLAINS
73	27	3	4	3	2 LU	9.90 MILES	CENTRAL GREAT PLAINS
74	27	4	4	0	3 LU	9.90 MILES	CENTRAL GREAT PLAINS
75	27	5	4	3	1 LU	9.90 MILES	CENTRAL GREAT PLAINS
76	27	6	4	1	3 LU	9.90 MILES	CENTRAL GREAT PLAINS
77	27	7	4	1	4 LU	9.90 MILES	CENTRAL GREAT PLAINS
78	29	1	4	0	2 LU	39.90 MILES	OZARK HIGHLANDS
79	29	2	4	0	0 LU	39.90 MILES	OZARK HIGHLANDS
80	29	3	4	3	2 LU	39.90 MILES	OZARK HIGHLANDS
81	29	4	4	0	3 LU	39.90 MILES	OZARK HIGHLANDS
82	29	5	4	1	1 LU	39.90 MILES	OZARK HIGHLANDS
83	29	6	4	1	3 LU	39.90 MILES	OZARK HIGHLANDS
84	29	7	4	1	4 LU	39.90 MILES	OZARK HIGHLANDS
85	35	1	4	0	2 LU	244.30 MILES	SOUTH CENTRAL PLAINS
86	35	2	4	0	0 LU	244.30 MILES	SOUTH CENTRAL PLAINS
87	35	3	4	3	3 LU	244.30 MILES	SOUTH CENTRAL PLAINS
88	35	4	4	0	4 LU	244.30 MILES	SOUTH CENTRAL PLAINS
89	35	5	4	1	1 LU	244.30 MILES	SOUTH CENTRAL PLAINS
90	35	6	4	1	2 LU	244.30 MILES	SOUTH CENTRAL PLAINS
91	35	7	4	1	2 LU	244.30 MILES	SOUTH CENTRAL PLAINS
92	36	1	4	0	2 LU	165.00 MILES	OUACHITA MOUNTAINS
93	36	2	4	0	0 LU	165.00 MILES	OUACHITA MOUNTAINS
94	36	3	4	3	3 LU	165.00 MILES	OUACHITA MOUNTAINS
95	36	4	4	0	4 LU	165.00 MILES	OUACHITA MOUNTAINS
96	36	5	4	1	1 LU	165.00 MILES	OUACHITA MOUNTAINS
97	36	6	4	1	3 LU	165.00 MILES	OUACHITA MOUNTAINS
98	36	7	4	1	2 LU	165.00 MILES	OUACHITA MOUNTAINS
99	37	1	4	0	1 LU	360.40 MILES	ARKANSAS VALLEY
100	37	2	4	0	0 LU	360.40 MILES	ARKANSAS VALLEY
101	37	3	4	3	2 LU	360.40 MILES	ARKANSAS VALLEY
102	37	4	4	0	3 LU	360.40 MILES	ARKANSAS VALLEY
103	37	5	4	1	1 LU	360.40 MILES	ARKANSAS VALLEY
104	37	6	4	1	2 LU	360.40 MILES	ARKANSAS VALLEY
105	37	7	4	1	1 LU	360.40 MILES	ARKANSAS VALLEY
106	37	1	4	0	1 LU	6.00 MILES	ARKANSAS VALLEY
107	37	2	4	0	0 LU	6.00 MILES	ARKANSAS VALLEY
108	37	3	4	3	2 LU	6.00 MILES	ARKANSAS VALLEY
109	37	4	4	0	3 LU	6.00 MILES	ARKANSAS VALLEY
110	37	5	4	3	1 LU	6.00 MILES	ARKANSAS VALLEY
111	37	6	4	1	2 LU	6.00 MILES	ARKANSAS VALLEY
112	37	7	4	1	1 LU	6.00 MILES	ARKANSAS VALLEY
113	38	1	4	0	1 LU	27.10 MILES	BOSTON MOUNTAINS
114	38	2	4	0	0 LU	27.10 MILES	BOSTON MOUNTAINS
115	38	3	4	3	3 LU	27.10 MILES	BOSTON MOUNTAINS
116	38	4	4	0	3 LU	27.10 MILES	BOSTON MOUNTAINS
117	38	5	4	1	1 LU	27.10 MILES	BOSTON MOUNTAINS
118	38	6	4	1	3 LU	27.10 MILES	BOSTON MOUNTAINS
119	38	7	4	1	2 LU	27.10 MILES	BOSTON MOUNTAINS
120	21	1	4	0	4 LU	346.10 MILES	SOUTHERN ROCKIES
121	21	2	4	0	0 LU	346.10 MILES	SOUTHERN ROCKIES
122	21	3	4	3	5 LU	346.10 MILES	SOUTHERN ROCKIES
123	21	4	4	0	1 LU	346.10 MILES	SOUTHERN ROCKIES
124	21	5	4	1	1 LU	346.10 MILES	SOUTHERN ROCKIES
125	21	6	4	1	4 LU	346.10 MILES	SOUTHERN ROCKIES
126	21	7	4	1	3 LU	346.10 MILES	SOUTHERN ROCKIES
127	21	1	4	0	4 LU	50.80 MILES	SOUTHERN ROCKIES
128	21	2	4	0	0 LU	50.80 MILES	SOUTHERN ROCKIES
129	21	3	4	3	5 LU	50.80 MILES	SOUTHERN ROCKIES

Non-Point Source Discharges

130	21	4	4	0	1 LU	50.80 MILES	SOUTHERN ROCKIES
131	21	5	4	3	1 LU	50.80 MILES	SOUTHERN ROCKIES
132	21	6	4	1	4 LU	50.80 MILES	SOUTHERN ROCKIES
133	21	7	4	1	3 LU	50.80 MILES	SOUTHERN ROCKIES
134	22	1	4	0	4 LU	1001.30 MILES	NEW MEXICO PLATEAU
135	22	2	4	0	0 LU	1001.30 MILES	NEW MEXICO PLATEAU
136	22	3	4	3	5 LU	1001.30 MILES	NEW MEXICO PLATEAU
137	22	4	4	0	1 LU	1001.30 MILES	NEW MEXICO PLATEAU
138	22	5	4	1	2 LU	1001.30 MILES	NEW MEXICO PLATEAU
139	22	6	4	1	4 LU	1001.30 MILES	NEW MEXICO PLATEAU
140	22	7	4	1	5 LU	1001.30 MILES	NEW MEXICO PLATEAU
141	22	1	4	0	4 LU	102.10 MILES	NEW MEXICO PLATEAU
142	22	2	4	0	0 LU	102.10 MILES	NEW MEXICO PLATEAU
143	22	3	4	3	5 LU	102.10 MILES	NEW MEXICO PLATEAU
144	22	4	4	0	1 LU	102.10 MILES	NEW MEXICO PLATEAU
145	22	5	4	3	2 LU	102.10 MILES	NEW MEXICO PLATEAU
146	22	6	4	1	4 LU	102.10 MILES	NEW MEXICO PLATEAU
147	22	7	4	1	5 LU	102.10 MILES	NEW MEXICO PLATEAU
148	23	1	4	0	4 LU	270.50 MILES	NEW MEXICO MOUNTAINS
149	23	2	4	0	0 LU	270.50 MILES	NEW MEXICO MOUNTAINS
150	23	3	4	3	5 LU	270.50 MILES	NEW MEXICO MOUNTAINS
151	23	4	4	0	1 LU	270.50 MILES	NEW MEXICO MOUNTAINS
152	23	5	4	1	5 LU	270.50 MILES	NEW MEXICO MOUNTAINS
153	23	6	4	1	5 LU	270.50 MILES	NEW MEXICO MOUNTAINS
154	23	7	4	1	3 LU	270.50 MILES	NEW MEXICO MOUNTAINS
155	23	1	4	0	4 LU	3.30 MILES	NEW MEXICO MOUNTAINS
156	23	2	4	0	0 LU	3.30 MILES	NEW MEXICO MOUNTAINS
157	23	3	4	3	5 LU	3.30 MILES	NEW MEXICO MOUNTAINS
158	23	4	4	0	1 LU	3.30 MILES	NEW MEXICO MOUNTAINS
159	23	5	4	3	5 LU	3.30 MILES	NEW MEXICO MOUNTAINS
160	23	6	4	1	5 LU	3.30 MILES	NEW MEXICO MOUNTAINS
161	23	7	4	1	3 LU	3.30 MILES	NEW MEXICO MOUNTAINS
162	34	1	4	0	1 LU	64.60 MILES	
163	34	2	4	0	0 LU	64.60 MILES	
164	34	3	4	3	2 LU	64.60 MILES	
165	34	4	4	0	4 LU	64.60 MILES	
166	34	5	4	1	1 LU	64.60 MILES	
167	34	6	4	1	2 LU	64.60 MILES	
168	34	7	4	1	3 LU	64.60 MILES	
169	34	1	4	0	1 LU	512.00 MILES	
170	34	2	4	0	0 LU	512.00 MILES	
171	34	3	4	3	2 LU	512.00 MILES	
172	34	4	4	0	4 LU	512.00 MILES	
173	34	5	4	3	1 LU	512.00 MILES	
174	34	6	4	1	2 LU	512.00 MILES	
175	34	7	4	1	3 LU	512.00 MILES	
176	32	1	4	0	2 LU	155.00 MILES	
177	32	2	4	0	0 LU	155.00 MILES	
178	32	3	4	3	5 LU	155.00 MILES	
179	32	4	4	0	4 LU	155.00 MILES	
180	32	5	4	2	1 LU	155.00 MILES	
181	32	6	4	1	2 LU	155.00 MILES	
182	32	7	4	1	4 LU	155.00 MILES	
183	33	1	4	0	2 LU	148.00 MILES	
184	33	2	4	0	0 LU	148.00 MILES	
185	33	3	4	3	2 LU	148.00 MILES	
186	33	4	4	0	4 LU	148.00 MILES	
187	33	5	4	1	1 LU	148.00 MILES	
188	33	6	4	1	2 LU	148.00 MILES	
189	33	7	4	1	3 LU	148.00 MILES	
190	33	1	4	0	2 LU	85.00 MILES	
191	33	2	4	0	0 LU	85.00 MILES	
192	33	3	4	3	2 LU	85.00 MILES	
193	33	4	4	0	4 LU	85.00 MILES	
194	33	5	4	3	1 LU	85.00 MILES	
195	33	6	4	1	2 LU	85.00 MILES	

Non-Point Source Discharges

196	33	7	4	1	3 LU	85.00 MILES
197	65	1	4	0	1 LU	37.00 MILES
198	65	2	4	0	0 LU	37.00 MILES
199	65	3	4	3	2 LU	37.00 MILES
200	65	4	4	0	5 LU	37.00 MILES
201	65	5	4	1	1 LU	37.00 MILES
202	65	6	4	1	4 LU	37.00 MILES
203	65	7	4	1	2 LU	37.00 MILES
204	74	1	4	0	1 LU	142.00 MILES
205	74	2	4	0	0 LU	142.00 MILES
206	74	3	4	3	2 LU	142.00 MILES
207	74	4	4	0	5 LU	142.00 MILES
208	74	5	4	1	1 LU	142.00 MILES
209	74	6	4	1	1 LU	142.00 MILES
210	74	7	4	1	2 LU	142.00 MILES
211	74	1	4	0	1 LU	10.00 MILES
212	74	2	4	0	0 LU	10.00 MILES
213	74	3	4	3	2 LU	10.00 MILES
214	74	4	4	0	5 LU	10.00 MILES
215	74	5	4	3	1 LU	10.00 MILES
216	74	6	4	1	1 LU	10.00 MILES
217	74	7	4	1	2 LU	10.00 MILES
218	65	1	4	0	1 LU	56.00 MILES
219	65	2	4	0	0 LU	56.00 MILES
220	65	3	4	3	2 LU	56.00 MILES
221	65	4	4	0	5 LU	56.00 MILES
222	65	5	4	1	1 LU	56.00 MILES
223	65	6	4	1	1 LU	56.00 MILES
224	65	7	4	1	1 LU	56.00 MILES
225	65	1	4	0	1 LU	13.00 MILES
226	65	2	4	0	0 LU	13.00 MILES
227	65	3	4	3	2 LU	13.00 MILES
228	65	4	4	0	5 LU	13.00 MILES
229	65	5	4	3	1 LU	13.00 MILES
230	65	6	4	1	1 LU	13.00 MILES
231	65	7	4	1	1 LU	13.00 MILES

Ozone and Carbon Monoxide

dh	ec	func	prob	imp	vul	spcode	spval	units	substr(sitedesc,1,40)	staff
1	35	1	15	0	2	AU	706062.00	ACRES	SOUTH CENTRAL PLAINS	
2	35	2	15	0	0	AU	706062.00	ACRES	SOUTH CENTRAL PLAINS	
3	35	3	15	1	3	AU	706062.00	ACRES	SOUTH CENTRAL PLAINS	
4	35	4	15	1	4	AU	706062.00	ACRES	SOUTH CENTRAL PLAINS	
5	35	5	15	1	1	AU	706062.00	ACRES	SOUTH CENTRAL PLAINS	
6	35	6	15	1	2	AU	706062.00	ACRES	SOUTH CENTRAL PLAINS	
7	35	7	15	1	2	AU	706062.00	ACRES	SOUTH CENTRAL PLAINS	
8	29	1	15	0	2	AU	2238190.00	ACRES	CENTRAL OKLA. TEX PLAINS	
9	29	2	15	0	0	AU	2238190.00	ACRES	CENTRAL OKLA. TEX. PLAINS	
10	29	3	15	1	2	AU	2238190.00	ACRES	CENTRAL OKLA. TEX. PLAINS	
11	29	4	15	1	3	AU	2238190.00	ACRES	CENTRAL OKLA. TEX. PLAINS	
12	29	5	15	1	1	AU	2238190.00	ACRES	CENTRAL OKLA. TEX. PLAINS	
13	29	6	15	1	3	AU	2238190.00	ACRES	CENTRAL OKLA. TEX. PLAINS	
14	29	7	15	1	4	AU	2238190.00	ACRES	CENTRAL OKLA. TEX. PLAINS	
15	32	1	15	0	2	AU	2354157.00	ACRES	TEXAS BLACKLAND PAIRIES	
16	32	2	15	0	0	AU	2354157.00	ACRES	TEXAS BLACKLAND PAIRIES	
17	32	3	15	1	2	AU	2354157.00	ACRES	TEXAS BLACKLAND PAIRIES	
18	32	4	15	1	4	AU	2354157.00	ACRES	TEXAS BLACKLAND PAIRIES	
19	32	5	15	1	1	AU	2354157.00	ACRES	TEXAS BLACKLAND PAIRIES	
20	32	6	15	1	2	AU	2354157.00	ACRES	TEXAS BLACKLAND PAIRIES	
21	32	7	15	1	4	AU	2354157.00	ACRES	TEXAS BLACKLAND PAIRIES	
22	33	1	15	0	2	AU	329110.00	ACRES	EAST CENTRAL TX. PLAINS	
23	33	2	15	0	0	AU	329110.00	ACRES	EAST CENTRAL TX. PLAINS	
24	33	3	15	1	2	AU	329110.00	ACRES	EAST CENTRAL TX. PLAINS	
25	33	4	15	1	4	AU	329110.00	ACRES	EAST CENTRAL TX. PLAINS	
26	33	5	15	1	1	AU	329110.00	ACRES	EAST CENTRAL TX. PLAINS	
27	33	6	15	1	2	AU	329110.00	ACRES	EAST CENTRAL TX. PLAINS	
28	33	7	15	1	3	AU	329110.00	ACRES	EAST CENTRAL TX. PLAINS	
29	34	1	15	0	1	AU	4432788.00	ACRES	WESTERN GULF COASTAL PLAIN	
30	34	2	15	0	0	AU	4432788.00	ACRES	WESTERN GULF COASTAL PLAIN	
31	34	3	15	1	2	AU	4432788.00	ACRES	WESTERN GULF COASTAL PLAIN	
32	34	4	15	1	4	AU	4432788.00	ACRES	WESTERN GULF COASTAL PLAIN	
33	34	5	15	1	1	AU	4432788.00	ACRES	WESTERN GULF COASTAL PLAIN	
34	34	6	15	1	2	AU	4432788.00	ACRES	WESTERN GULF COASTAL PLAIN	
35	34	7	15	1	3	AU	4432788.00	ACRES	WESTERN GULF COASTAL PLAIN	
36	34	1	15	0	1	AU	1735017.00	ACRES	WESTERN GULF COASTAL PLAIN	
37	34	2	15	0	0	AU	1735017.00	ACRES	WESTERN GULF COASTAL PLAIN	
38	34	3	15	1	2	AU	1735017.00	ACRES	WESTERN GULF COASTAL PLAIN	
39	34	4	15	1	4	AU	1735017.00	ACRES	WESTERN GULF COASTAL PLAIN	
40	34	5	15	1	1	AU	1735017.00	ACRES	WESTERN GULF COASTAL PLAIN	
41	34	6	15	2	2	AU	1735017.00	ACRES	WESTERN GULF COASTAL PLAIN	
42	34	7	15	2	3	AU	1735017.00	ACRES	WESTERN GULF COASTAL PLAIN	
43	74	1	15	0	1	AU	296897.00	ACRES	MISS. VALLEY LOESS PLAINS	
44	74	2	15	0	0	AU	296897.00	ACRES	MISS. VALLEY LOESS PLAINS	
45	74	3	15	1	2	AU	296897.00	ACRES	MISS. VALLEY LOESS PLAINS	
46	74	4	15	1	5	AU	296897.00	ACRES	MISS. VALLEY LOESS PLAINS	
47	74	5	15	1	1	AU	296897.00	ACRES	MISS. VALLEY LOESS PLAINS	
48	74	6	15	2	1	AU	296897.00	ACRES	MISS. VALLEY LOESS PLAINS	
49	74	7	15	2	2	AU	296897.00	ACRES	MISS. VALLEY LOESS PLAINS	
50	74	1	15	0	1	AU	435678.00	ACRES	MISS. VALLEY LOESS PLAINS	
51	74	2	15	0	0	AU	435678.00	ACRES	MISS. VALLEY LOESS PLAINS	
52	74	3	15	1	2	AU	435678.00	ACRES	MISS. VALLEY LOESS PLAINS	
53	74	4	15	1	5	AU	435678.00	ACRES	MISS. VALLEY LOESS PLAINS	
54	74	5	15	1	1	AU	435678.00	ACRES	MISS. VALLEY LOESS PLAINS	
55	74	6	15	2	1	AU	435678.00	ACRES	MISS. VALLEY LOESS PLAINS	
56	74	7	15	2	2	AU	435678.00	ACRES	MISS. VALLEY LOESS PLAINS	
57	73	1	15	0	1	AU	608611.00	ACRES	MISS. ALLUVIAL PLAIN	
58	73	2	15	0	0	AU	608611.00	ACRES	MISS. ALLUVIAL PLAIN	
59	73	3	15	1	2	AU	608611.00	ACRES	MISS. ALLUVIAL PLAIN	
60	73	4	15	1	5	AU	608611.00	ACRES	MISS. ALLUVIAL PLAIN	
61	73	5	15	1	1	AU	608611.00	ACRES	MISS. ALLUVIAL PLAIN	
62	73	6	15	1	1	AU	608611.00	ACRES	MISS. ALLUVIAL PLAIN	
63	73	7	15	1	1	AU	608611.00	ACRES	MISS. ALLUVIAL PLAIN	

Ozone and Carbon Monoxide

64	22	1	15	0	4 AU	743466.00 ACRES	ARIZ, NEW MEXICO, PLATEAU
65	22	2	15	0	0 AU	743466.00 ACRES	ARIZ, NEW MEXICO, PLATEAU
66	22	3	15	1	5 AU	743466.00 ACRES	ARIZ, NEW MEXICO, PLATEAU
67	22	4	15	1	1 AU	743466.00 ACRES	ARIZ, NEW MEXICO, PLATEAU
68	22	5	15	1	2 AU	743466.00 ACRES	ARIZ, NEW MEXICO, PLATEAU
69	22	6	15	1	4 AU	743466.00 ACRES	ARIZ, NEW MEXICO, PLATEAU
70	22	7	15	1	5 AU	743466.00 ACRES	ARIZ, NEW MEXICO, PLATEAU
71	27	1	15	0	3 AU	448511.00 ACRES	CENTRAL GREAT PLAINS
72	27	2	15	0	0 AU	448511.00 ACRES	CENTRAL GREAT PLAINS
73	27	3	15	1	2 AU	448511.00 ACRES	CENTRAL GREAT PLAINS
74	27	4	15	1	3 AU	448511.00 ACRES	CENTRAL GREAT PLAINS
75	27	5	15	1	1 AU	448511.00 ACRES	CENTRAL GREAT PLAINS
76	27	6	15	1	3 AU	448511.00 ACRES	CENTRAL GREAT PLAINS
77	27	7	15	1	4 AU	448511.00 ACRES	CENTRAL GREAT PLAINS
78	24	1	15	0	5 AU	639084.00 ACRES	SOUTHERN DESERTS
79	24	2	15	0	0 AU	639084.00 ACRES	SOUTHERN DESERTS
80	24	3	15	1	5 AU	639084.00 ACRES	SOUTHERN DESERTS
81	24	4	15	1	1 AU	639084.00 ACRES	SOUTHERN DESERTS
82	24	5	15	1	1 AU	639084.00 ACRES	SOUTHERN DESERTS
83	24	6	15	1	4 AU	639084.00 ACRES	SOUTHERN DESERTS
84	24	7	15	1	5 AU	639084.00 ACRES	SOUTHERN DESERTS
85	24	1	15	0	5 AU	639084.00 ACRES	SOUTHERN DESERTS
86	24	2	15	0	0 AU	639084.00 ACRES	SOUTHERN DESERTS
87	24	3	15	1	5 AU	639084.00 ACRES	SOUTHERN DESERTS
88	24	4	15	1	1 AU	639084.00 ACRES	SOUTHERN DESERTS
89	24	5	15	1	1 AU	639084.00 ACRES	SOUTHERN DESERTS
90	24	6	15	1	4 AU	639084.00 ACRES	SOUTHERN DESERTS
91	24	7	15	1	5 AU	639084.00 ACRES	SOUTHERN DESERTS
92	73	1	15	0	1 AU	608611.00 ACRES	W.B.R. PARISH
93	73	2	15	0	0 AU	608611.00 ACRES	W.B.R. PARISH
94	73	3	15	1	2 AU	608611.00 ACRES	W.B.R. PARISH
95	73	4	15	1	5 AU	608611.00 ACRES	W.B.R. PARISH
96	73	5	15	1	1 AU	608611.00 ACRES	W.B.R. PARISH
97	73	6	15	2	1 AU	608611.00 ACRES	W.B.R. PARISH
98	73	7	15	2	1 AU	608611.00 ACRES	W.B.R. PARISH
99	0	0	0	0	0	0.00	

Particulate Matter

record#	ec	func	prob	imp	vul	spcode	spval	units	substr(sitedesc,1,40)	staff
1	22	1	17	0	4	AU	81408.00	ACRES	ARIZONA,NEW MEXICO,PLATEAU	
2	22	2	17	0	0	AU	81408.00	ACRES	ARIZONA,NEW MEXICO,PLATEAU	
3	22	3	17	1	5	AU	81408.00	ACRES	ARIZONA, NEW MEXICO,PLATEAU	
4	22	4	17	1	1	AU	81408.00	ACRES	ARIZONA, NEW MEXICO,PLATEAU	
5	22	5	17	1	2	AU	81408.00	ACRES	ARIZONA, NEW MEXICO, PLATEAU	
6	22	6	17	1	4	AU	81408.00	ACRES	ARIZONA,NEW MEXICO,PLATEAU	
7	22	7	17	1	5	AU	81408.00	ACRES	ARIZONA, NEW MEXICO,PLATEAU	
8	24	1	17	0	5	AU	153408.00	ACRES	SOUTHERN DESERTS	
9	24	2	17	0	0	AU	153408.00	ACRES	SOUTHERN DESERTS	
10	24	3	17	1	5	AU	153408.00	ACRES	SOUTHERN DESERTS	
11	24	4	17	1	1	AU	153408.00	ACRES	SOUTHERN DESERTS	
12	24	5	17	1	1	AU	153408.00	ACRES	SOUTHERN DESERTS	
13	24	6	17	1	4	AU	153408.00	ACRES	SOUTHERN DESERTS	
14	24	7	17	1	5	AU	153408.00	ACRES	SOUTHERN DESERTS	
15	24	1	17	0	5	AU	8150.00	ACRES	SOUTHERN DESERTS	
16	24	2	17	0	0	AU	8150.00	ACRES	SOUTHERN DESERTS	
17	24	3	17	1	5	AU	8150.00	ACRES	SOUTHERN DESERTS	
18	24	4	17	1	1	AU	8150.00	ACRES	SOUTHERN DESERTS	
19	24	5	17	1	1	AU	8150.00	ACRES	SOUTHERN DESERTS	
20	24	6	17	1	4	AU	8150.00	ACRES	SOUTHERN DESERTS	
21	24	7	17	1	5	AU	8150.00	ACRES	SOUTHERN DESERTS	
22	25	1	17	0	5	AU	68032.00	ACRES	WESTERN HIGH PLAINS	
23	25	2	17	0	0	AU	68032.00	ACRES	WESTERN HIGH PLAINS	
24	25	3	17	1	3	AU	68032.00	ACRES	WESTERN HIGH PLAINS	
25	25	4	17	1	2	AU	68032.00	ACRES	WESTERN HIGH PLAINS	
26	25	5	17	1	0	AU	68032.00	ACRES	WESTERN HIGH PLAINS	
27	25	6	17	1	1	AU	68032.00	ACRES	WESTERN HIGH PLAINS	
28	25	7	17	1	4	AU	68032.00	ACRES	WESTERN HIGH PLAINS	

Physical Degradation of Water and Wetlands

Record#	ec	func	prob	imp	vul	spcode	spval	units	substr(sitedesc,1,40)	staff
1	29	1	5	4	2	AU	130100.00	ACRES	CENTRAL OK\TX PLAINS	
2	29	2	5	0	0	AU	130100.00	ACRES	CENTRAL OK\TX PLAINS	
3	29	3	5	2	2	AU	130100.00	ACRES	CENTRAL OK\TX PLAINS	
4	29	4	5	4	3	AU	130100.00	ACRES	CENTRAL OK\TX PLAINS	
5	29	5	5	4	1	AU	130100.00	ACRES	CENTRAL OK\TX PLAINS	
6	29	6	5	4	3	AU	130100.00	ACRES	CENTRAL OK\TX PLAINS	
7	29	7	5	3	4	AU	130100.00	ACRES	CENTRAL OK\TX PLAINS	
8	36	1	5	4	2	AU	490000.00	ACRES	OUCHITA MOUNTAINS	
9	36	2	5	0	0	AU	490000.00	ACRES	OUCHITA MOUNTAINS	
10	36	3	5	2	3	AU	490000.00	ACRES	OUCHITA MOUNTAINS	
11	36	4	5	4	4	AU	490000.00	ACRES	OUCHITA MOUNTAINS	
12	36	5	5	4	1	AU	490000.00	ACRES	OUCHITA MOUNTAINS	
13	36	6	5	4	3	AU	490000.00	ACRES	OUCHITA MOUNTAINS	
14	36	7	5	3	2	AU	490000.00	ACRES	OUCHITA MOUNTAINS	
15	37	1	5	4	1	AU	420000.00	ACRES	ARKANSAS VALLEY	
16	37	2	5	0	0	AU	420000.00	ACRES	ARKANSAS VALLEY	
17	37	3	5	2	2	AU	420000.00	ACRES	ARKANSAS VALLEY	
18	37	4	5	4	3	AU	420000.00	ACRES	ARKANSAS VALLEY	
19	37	5	5	4	1	AU	420000.00	ACRES	ARKANSAS VALLEY	
20	37	6	5	4	2	AU	420000.00	ACRES	ARKANSAS VALLEY	
21	37	7	5	3	1	AU	420000.00	ACRES	ARKANSAS VALLEY	
22	39	1	5	4	1	AU	410000.00	ACRES	OZARK HIGHLANDS	
23	39	2	5	0	0	AU	410000.00	ACRES	OZARK HIGHLANDS	
24	39	3	5	2	3	AU	410000.00	ACRES	OZARK HIGHLANDS	
25	39	4	5	4	3	AU	410000.00	ACRES	OZARK HIGHLANDS	
26	39	5	5	4	1	AU	410000.00	ACRES	OZARK HIGHLANDS	
27	39	6	5	4	2	AU	410000.00	ACRES	OZARK HIGHLANDS	
28	39	7	5	3	2	AU	410000.00	ACRES	OZARK HIGHLANDS	
29	40	1	5	4	1	AU	80770.00	ACRES	CENTRAL IRREGULAR PLAINS	
30	40	2	5	0	0	AU	80770.00	ACRES	CENTRAL IRREGULAR PLAINS	
31	40	3	5	2	3	AU	80770.00	ACRES	CENTRAL IRREGULAR PLAINS	
32	40	4	5	4	3	AU	80770.00	ACRES	CENTRAL IRREGULAR PLAINS	
33	40	5	5	4	1	AU	80770.00	ACRES	CENTRAL IRREGULAR PLAINS	
34	40	6	5	4	5	AU	80770.00	ACRES	CENTRAL IRREGULAR PLAINS	
35	40	7	5	3	3	AU	80770.00	ACRES	CENTRAL IRREGULAR PLAINS	
36	35	1	5	4	2	AU	2500000.00	ACRES	SOUTH CENTRAL PLAINS	
37	35	2	5	0	0	AU	2500000.00	ACRES	SOUTH CENTRAL PLAINS	
38	35	3	5	2	3	AU	2500000.00	ACRES	SOUTH CENTRAL PLAINS	
39	35	4	5	4	4	AU	2500000.00	ACRES	SOUTH CENTRAL PLAINS	
40	35	5	5	4	1	AU	2500000.00	ACRES	SOUTH CENTRAL PLAINS	
41	35	6	5	4	2	AU	2500000.00	ACRES	SOUTH CENTRAL PLAINS	
42	35	7	5	3	2	AU	2500000.00	ACRES	SOUTH CENTRAL PLAINS	
43	35	1	5	4	2	AU	1653120.00	ACRES	SOUTH CENTRAL PLAINS	
44	35	2	5	0	0	AU	1653120.00	ACRES	SOUTH CENTRAL PLAINS	
45	35	3	5	2	3	AU	1653120.00	ACRES	SOUTH CENTRAL PLAINS	
46	35	4	5	4	4	AU	1653120.00	ACRES	SOUTH CENTRAL PLAINS	
47	35	5	5	4	1	AU	1653120.00	ACRES	SOUTH CENTRAL PLAINS	
48	35	6	5	4	2	AU	1653120.00	ACRES	SOUTH CENTRAL PLAINS	
49	35	7	5	3	2	AU	1653120.00	ACRES	SOUTH CENTRAL PLAINS	
50	33	1	5	4	2	AU	826560.00	ACRES	EAST CENTRAL TX. PLAINS	
51	33	2	5	0	0	AU	826560.00	ACRES	EAST CENTRAL TX. PLAINS	
52	33	3	5	2	2	AU	826560.00	ACRES	EAST CENTRAL TX. PLAINS	
53	33	4	5	4	4	AU	826560.00	ACRES	EAST CENTRAL TX. PLAINS	
54	33	5	5	4	1	AU	826560.00	ACRES	EAST CENTRAL TX. PLAINS	
55	33	6	5	4	2	AU	826560.00	ACRES	EAST CENTRAL TX. PLAINS	
56	33	7	5	3	3	AU	826560.00	ACRES	EAST CENTRAL TX. PLAINS	
57	32	1	5	4	2	AU	275520.00	ACRES	TEXAS BLACKLAND PRAIRIES	
58	32	2	5	0	0	AU	275520.00	ACRES	TEXAS BLACKLAND PRAIRIES	
59	32	3	5	2	2	AU	275520.00	ACRES	TEXAS BLACKLAND PRAIRIES	
60	32	4	5	4	4	AU	275520.00	ACRES	TEXAS BLACKLAND PRAIRIES	
61	32	5	5	4	1	AU	275520.00	ACRES	TEXAS BLACKLAND PRAIRIES	
62	32	6	5	4	2	AU	275520.00	ACRES	TEXAS BLACKLAND PRAIRIES	
63	32	7	5	3	4	AU	275520.00	ACRES	TEXAS BLACKLAND PRAIRIES	

Physical Degradation of Water and Wetlands

64	38	1	5	4	1	AU	400000.00 ACRES	BOSTON MOUNTAINS
65	38	2	5	0	0	AU	400000.00 ACRES	BOSTON MOUNTAINS
66	38	3	5	2	3	AU	400000.00 ACRES	BOSTON MOUNTAINS
67	38	4	5	4	3	AU	400000.00 ACRES	BOSTON MOUNTAINS
68	38	5	5	4	1	AU	400000.00 ACRES	BOSTON MOUNTAINS
69	38	6	5	4	3	AU	400000.00 ACRES	BOSTON MOUNTAINS
70	38	7	5	3	2	AU	400000.00 ACRES	BOSTON MOUNTAINS
71	73	1	5	4	1	AU	3600000.00 ACRES	MISS. ALLUVIAL PLAIN
72	73	2	5	0	0	AU	3600000.00 ACRES	MISS. ALLUVIAL PLAIN
73	73	3	5	2	2	AU	3600000.00 ACRES	MISS. ALLUVIAL PLAIN
74	73	4	5	4	5	AU	3600000.00 ACRES	MISS. ALLUVIAL PLAIN
75	73	5	5	4	1	AU	3600000.00 ACRES	MISS. ALLUVIAL PLAIN
76	73	6	5	4	1	AU	3600000.00 ACRES	MISS. ALLUVIAL PLAIN
77	73	7	5	3	1	AU	3600000.00 ACRES	MISS. ALLUVIAL PLAIN
78	34	1	5	4	1	AU	1800000.00 ACRES	WESTERN GULF COASTAL PLAIN
79	34	2	5	0	0	AU	1800000.00 ACRES	WESTERN GULF COASTAL PLAIN
80	34	3	5	2	2	AU	1800000.00 ACRES	WESTERN GULF COASTAL PLAIN
81	34	4	5	4	4	AU	1800000.00 ACRES	WESTERN GULF COASTAL PLAIN
82	34	5	5	4	1	AU	1800000.00 ACRES	WESTERN GULF COASTAL PLAIN
83	34	6	5	4	4	AU	1800000.00 ACRES	WESTERN GULF COASTAL PLAIN
84	34	7	5	3	3	AU	1800000.00 ACRES	WESTERN GULF COASTAL PLAIN
85	34	1	5	4	1	AU	795135.00 ACRES	WESTERN GULF COASTAL PLAIN
86	34	2	5	0	0	AU	795135.00 ACRES	WESTERN GULF COASTAL PLAIN
87	34	3	5	2	2	AU	795135.00 ACRES	WESTERN GULF COASTAL PLAIN
88	34	4	5	4	4	AU	795135.00 ACRES	WESTERN GULF COASTAL PLAIN
89	34	5	5	4	1	AU	795135.00 ACRES	WESTERN GULF COASTAL PLAIN
90	34	6	5	4	2	AU	795135.00 ACRES	WESTERN GULF COASTAL PLAIN
91	34	7	5	4	3	AU	795135.00 ACRES	WESTERN GULF COASTAL PLAIN
92	73	1	5	5	1	AU	1385000.00 ACRES	MISS. ALLUVIAL PLAIN
93	73	2	5	0	0	AU	1385000.00 ACRES	MISS. ALLUVIAL PLAIN
94	73	3	5	2	2	AU	1385000.00 ACRES	MISS. ALLUVIAL PLAIN
95	73	4	5	6	5	AU	1385000.00 ACRES	MISS. ALLUVIAL PLAIN
96	73	5	5	5	1	AU	1385000.00 ACRES	MISS. ALLUVIAL PLAIN
97	73	6	5	6	1	AU	1385000.00 ACRES	MISS. ALLUVIAL PLAIN
98	73	7	5	5	1	AU	1385000.00 ACRES	MISS. ALLUVIAL PLAIN
99	34	1	5	4	1	AU	757594.00 ACRES	WESTERN GULF COASTAL PLAIN
100	34	2	5	0	0	AU	757594.00 ACRES	WESTERN GULF COASTAL PLAIN
101	34	3	5	2	2	AU	757594.00 ACRES	WESTERN GULF COASTAL PLAIN
102	34	4	5	4	4	AU	757594.00 ACRES	WESTERN GULF COASTAL PLAIN
103	34	5	5	4	1	AU	757594.00 ACRES	WESTERN GULF COASTAL PLAIN
104	34	6	5	4	2	AU	757594.00 ACRES	WESTERN GULF COASTAL PLAIN
105	34	7	5	4	3	AU	757594.00 ACRES	WESTERN GULF COASTAL PLAIN
106	34	1	5	5	1	AU	440500.00 ACRES	MISS. ALLUVIAL PLAIN
107	34	2	5	0	0	AU	440500.00 ACRES	MISS. ALLUVIAL PLAIN
108	34	3	5	2	2	AU	440500.00 ACRES	MISS. ALLUVIAL PLAIN
109	34	4	5	6	5	AU	440500.00 ACRES	MISS. ALLUVIAL PLAIN
110	34	5	5	5	1	AU	440500.00 ACRES	MISS. ALLUVIAL PLAIN
111	34	6	5	6	1	AU	440500.00 ACRES	MISS. ALLUVIAL PLAIN
112	34	7	5	5	1	AU	440500.00 ACRES	MISS. ALLUVIAL PLAIN
113	25	1	5	4	4	AU	296000.00 ACRES	SOUTHWEST LAKELANDS
114	25	2	5	0	0	AU	296000.00 ACRES	SOUTHWEST LAKELANDS
115	25	3	5	3	3	AU	296000.00 ACRES	SOUTHWEST LAKELANDS
116	25	4	5	2	2	AU	296000.00 ACRES	SOUTHWEST LAKELANDS
117	25	5	5	4	1	AU	296000.00 ACRES	SOUTHWEST LAKELANDS
118	25	6	5	4	1	AU	296000.00 ACRES	SOUTHWEST LAKELANDS
119	25	7	5	4	4	AU	296000.00 ACRES	SOUTHWEST LAKELANDS
120	34	1	5	4	1	AU	5300.00 ACRES	WESTERN GULF COASTAL PLAIN
121	34	2	5	0	0	AU	5300.00 ACRES	WESTERN GULF COASTAL PLAIN
122	34	3	5	3	2	AU	5300.00 ACRES	WESTERN GULF COASTAL PLAIN
123	34	4	5	2	4	AU	5300.00 ACRES	WESTERN GULF COASTAL PLAIN
124	34	5	5	4	1	AU	5300.00 ACRES	WESTERN GULF COASTAL PLAIN
125	34	6	5	4	2	AU	5300.00 ACRES	WESTERN GULF COASTAL PLAIN
126	34	7	5	4	3	AU	5300.00 ACRES	WESTERN GULF COASTAL PLAIN
127	31	1	5	4	3	AU	89000.00 ACRES	SOUTH TX. PLAINS
128	31	2	5	0	0	AU	89000.00 ACRES	SOUTH TX. PLAINS
129	31	3	5	3	3	AU	89000.00 ACRES	SOUTH TX. PLAINS

Physical Degradation of Water and Wetlands

130	31	4	5	2	3 AU	89000.00 ACRES	SOUTH TX. PLAINS
131	31	5	5	4	1 AU	89000.00 ACRES	SOUTH TX. PLAINS
132	31	6	5	4	1 AU	89000.00 ACRES	SOUTH TX. PLAINS
133	31	7	5	4	3 AU	89000.00 ACRES	SOUTH TX. PLAINS
134	22	1	5	4	4 AU	200000.00 ACRES	ARZ,NEW MEXICO, PLATEAU
135	22	2	5	0	0 AU	200000.00 ACRES	ARZ,NEW MEXICO, PLATEAU
136	22	3	5	2	5 AU	200000.00 ACRES	ARZ,NEW MEXICO,PLATEAU
137	22	4	5	4	1 AU	200000.00 ACRES	ARZ,NEW MEXICO,PLATEAU
138	22	5	5	4	2 AU	200000.00 ACRES	ARZ,NEW MEXICO,PLATEAU
139	22	6	5	4	4 AU	200000.00 ACRES	ARZ,NEW MEXICO,PLATEAU
140	22	7	5	3	5 AU	200000.00 ACRES	ARZ,NEW MEXICO,PLATEAU
141	24	1	5	4	5 AU	330000.00 ACRES	SOUTHERN DESERTS
142	24	2	5	0	0 AU	330000.00 ACRES	SOUTHERN DESERTS
143	24	3	5	2	5 AU	330000.00 ACRES	SOUTHERN DESERTS
144	24	4	5	4	1 AU	330000.00 ACRES	SOUTHERN DESERTS
145	24	5	5	4	1 AU	330000.00 ACRES	SOUTHERN DESERTS
146	24	6	5	4	4 AU	330000.00 ACRES	SOUTHERN DESERTS
147	24	7	5	3	5 AU	330000.00 ACRES	SOUTHERN DESERTS
148	26	1	5	4	3 AU	310000.00 ACRES	SOUTHWESTERN TABLELANDS
149	26	2	5	0	0 AU	310000.00 ACRES	SOUTHWESTERN TABLELANDS
150	26	3	5	2	3 AU	310000.00 ACRES	SOUTHWESTERN TABLELANDS
151	26	4	5	4	2 AU	310000.00 ACRES	SOUTHWESTERN TABLELANDS
152	26	5	5	4	1 AU	310000.00 ACRES	SOUTHWESTERN TABLELANDS
153	26	6	5	4	1 AU	310000.00 ACRES	SOUTHWESTERN TABLELANDS
154	26	7	5	3	4 AU	310000.00 ACRES	SOUTHWESTERN TABLELANDS
155	23	1	5	4	4 AU	110000.00 ACRES	AR/NEW MEXICO MOUNTAINS
156	23	2	5	0	0 AU	110000.00 ACRES	AR/NEW MEXICO MOUNTAINS
157	23	3	5	2	5 AU	110000.00 ACRES	AR/NEW MEXICO MOUNTAINS
158	23	4	5	4	1 AU	110000.00 ACRES	AR/NEW MEXICO MOUNTAINS
159	23	5	5	4	5 AU	110000.00 ACRES	AR/NEW MEXICO MOUNTAINS
160	23	6	5	4	5 AU	110000.00 ACRES	AR/NEW MEXICO MOUNTAINS
161	23	7	5	3	3 AU	110000.00 ACRES	AR/NEW MEXICO MOUNTAINS
162	25	1	5	4	5 AU	190000.00 ACRES	HIGH PLAINS
163	25	2	5	0	0 AU	190000.00 ACRES	HIGH PLAINS
164	25	3	5	2	3 AU	190000.00 ACRES	HIGH PLAINS
165	25	4	5	4	2 AU	190000.00 ACRES	HIGH PLAINS
166	25	5	5	4	1 AU	190000.00 ACRES	HIGH PLAINS
167	25	6	5	4	1 AU	190000.00 ACRES	HIGH PLAINS
168	25	7	5	3	4 AU	190000.00 ACRES	HIGH PLAINS
169	27	1	5	4	3 AU	410000.00 ACRES	CENTRAL GREAT PLAINS
170	27	2	5	0	0 AU	410000.00 ACRES	CENTRAL GREAT PLAINS
171	27	3	5	2	2 AU	410000.00 ACRES	CENTRAL GREAT PLAINS
172	27	4	5	4	3 AU	410000.00 ACRES	CENTRAL GREAT PLAINS
173	27	5	5	4	1 AU	410000.00 ACRES	CENTRAL GREAT PLAINS
174	27	6	5	4	3 AU	410000.00 ACRES	CENTRAL GREAT PLAINS
175	27	7	5	3	4 AU	410000.00 ACRES	CENTRAL GREAT PLAINS
176	29	1	5	4	2 AU	450000.00 ACRES	OK/TEXAS PLAINS
177	29	2	5	0	0 AU	450000.00 ACRES	OK/TEXAS PLAINS
178	29	3	5	2	2 AU	450000.00 ACRES	OK/TEXAS PLAINS
179	29	4	5	4	3 AU	450000.00 ACRES	OK/TEXAS PLAINS
180	29	5	5	4	1 AU	450000.00 ACRES	OK/TEXAS PLAINS
181	29	6	5	4	3 AU	450000.00 ACRES	OK/TEXAS PLAINS
182	29	7	5	3	4 AU	450000.00 ACRES	OK/TEXAS PLAINS
183	30	1	5	4	3 AU	200000.00 ACRES	CENTRAL TX. PLAINS
184	30	2	5	0	0 AU	200000.00 ACRES	CENTRAL TX. PLAINS
185	30	3	5	2	3 AU	200000.00 ACRES	CENTRAL TX. PLAINS
186	30	4	5	4	3 AU	200000.00 ACRES	CENTRAL TX. PLAINS
187	30	5	5	4	1 AU	200000.00 ACRES	CENTRAL TX. PLAINS
188	30	6	5	4	2 AU	200000.00 ACRES	CENTRAL TX. PLAINS
189	30	7	5	3	3 AU	200000.00 ACRES	CENTRAL TX. PLAINS
190	31	1	5	4	3 AU	160000.00 ACRES	SOUTHERN TX. PLAINS
191	31	2	5	0	0 AU	160000.00 ACRES	SOUTHERN TX. PLAINS
192	31	3	5	2	3 AU	160000.00 ACRES	SOUTHERN TX. PLAINS
193	31	4	5	4	3 AU	160000.00 ACRES	SOUTHERN TX. PLAINS
194	31	5	5	4	1 AU	160000.00 ACRES	SOUTHERN TX. PLAINS
195	31	6	5	4	1 AU	160000.00 ACRES	SOUTHERN TX. PLAINS

Physical Degradation of Water and Wetlands

196 31 7 5 3 3 AU

160000.00 ACRES

SOUTHERN TX. PLAINS

POTW Discharges to Surface Waters

Record#	ec	func	prob	imp	vul	spcode	spval	units	substr(sitedesc,1,40)	staff
1	21	1	2	0	4	LU	8.20	MILES	SOUTHERN ROCKIES	
2	21	2	2	0	0	LU	8.20	MILES	SOUTHERN ROCKIES	
3	21	3	2	3	5	LU	8.20	MILES	SOUTHERN ROCKIES	
4	21	4	2	0	1	LU	8.20	MILES	SOUTHERN ROCKIES	
5	21	5	2	1	1	LU	8.20	MILES	SOUTHERN ROCKIES	
6	21	6	2	1	4	LU	8.20	MILES	SOUTHERN ROCKIES	
7	21	7	2	1	3	LU	8.20	MILES	SOUTHERN ROCKIES	
8	22	1	2	0	4	LU	23.10	MILES	NEW MEXICO PLATEAU	
9	22	2	2	0	0	LU	23.10	MILES	NEW MEXICO PLATEAU	
10	22	3	2	3	5	LU	23.10	MILES	NEW MEXICO PLATEAU	
11	22	4	2	0	1	LU	23.10	MILES	NEW MEXICO PLATEAU	
12	22	5	2	1	2	LU	23.10	MILES	NEW MEXICO PLATEAU	
13	22	6	2	1	4	LU	23.10	MILES	NEW MEXICO PLATEAU	
14	22	7	2	1	5	LU	23.10	MILES	NEW MEXICO PLATEAU	
15	22	1	2	0	4	LU	82.50	MILES	NEW MEXICO PLATEAU	
16	22	2	2	0	0	LU	82.50	MILES	NEW MEXICO PLATEAU	
17	22	3	2	3	5	LU	82.50	MILES	NEW MEXICO PLATEAU	
18	22	4	2	0	1	LU	82.50	MILES	NEW MEXICO PLATEAU	
19	22	5	2	3	2	LU	82.50	MILES	NEW MEXICO PLATEAU	
20	22	6	2	1	4	LU	82.50	MILES	NEW MEXICO PLATEAU	
21	22	7	2	1	5	LU	82.50	MILES	NEW MEXICO PLATEAU	
22	23	1	2	0	4	LU	14.20	MILES	NEW MEXICO MOUNTAINS	
23	23	2	2	0	0	LU	14.20	MILES	NEW MEXICO MOUNTAINS	
24	23	3	2	3	5	LU	14.20	MILES	NEW MEXICO MOUNTAINS	
25	23	4	2	0	1	LU	14.20	MILES	NEW MEXICO MOUNTAINS	
26	23	5	2	1	5	LU	14.20	MILES	NEW MEXICO MOUNTAINS	
27	23	6	2	1	5	LU	14.20	MILES	NEW MEXICO MOUNTAINS	
28	23	7	2	1	3	LU	14.20	MILES	NEW MEXICO MOUNTAINS	
29	35	1	2	0	2	LU	597.00	MILES	SOUTH CENTRAL PLAINS	
30	35	2	2	0	0	LU	597.00	MILES	SOUTH CENTRAL PLAINS	
31	35	3	2	3	3	LU	597.00	MILES	SOUTH CENTRAL PLAINS	
32	35	4	2	0	4	LU	597.00	MILES	SOUTH CENTRAL PLAINS	
33	35	5	2	1	1	LU	597.00	MILES	SOUTH CENTRAL PLAINS	
34	35	6	2	1	2	LU	597.00	MILES	SOUTH CENTRAL PLAINS	
35	35	7	2	1	2	LU	597.00	MILES	SOUTH CENTRAL PLAINS	
36	35	1	2	0	2	LU	79.00	MILES	SOUTH CENTRAL PLAINS	
37	35	2	2	0	0	LU	79.00	MILES	SOUTH CENTRAL PLAINS	
38	35	3	2	3	3	LU	79.00	MILES	SOUTH CENTRAL PLAINS	
39	35	4	2	0	4	LU	79.00	MILES	SOUTH CENTRAL PLAINS	
40	35	5	2	3	1	LU	79.00	MILES	SOUTH CENTRAL PLAINS	
41	35	6	2	1	2	LU	79.00	MILES	SOUTH CENTRAL PLAINS	
42	35	7	2	1	2	LU	79.00	MILES	SOUTH CENTRAL PLAINS	
43	37	1	2	0	1	LU	23.00	MILES	ARKANSAS VALLEY	
44	37	2	2	0	0	LU	23.00	MILES	ARKANSAS VALLEY	
45	37	3	2	3	2	LU	23.00	MILES	ARKANSAS VALLEY	
46	37	4	2	0	3	LU	23.00	MILES	ARKANSAS VALLEY	
47	37	5	2	3	1	LU	23.00	MILES	ARKANSAS VALLEY	
48	37	6	2	1	2	LU	23.00	MILES	ARKANSAS VALLEY	
49	37	7	2	1	1	LU	23.00	MILES	ARKANSAS VALLEY	
50	39	1	2	0	1	LU	14.10	MILES	OZARK HIGHLANDS	
51	39	2	2	0	0	LU	14.10	MILES	OZARK HIGHLANDS	
52	39	3	2	3	3	LU	14.10	MILES	OZARK HIGHLANDS	
53	39	4	2	0	3	LU	14.10	MILES	OZARK HIGHLANDS	
54	39	5	2	3	1	LU	14.10	MILES	OZARK HIGHLANDS	
55	39	6	2	1	2	LU	14.10	MILES	OZARK HIGHLANDS	
56	39	7	2	1	2	LU	14.10	MILES	OZARK HIGHLANDS	
57	40	1	2	0	1	LU	49.70	MILES	CENTRAL IRREGULAR PLAINS	
58	40	2	2	0	0	LU	49.70	MILES	CENTRAL IRREGULAR PLAINS	
59	40	3	2	3	3	LU	49.70	MILES	CENTRAL IRREGULAR PLAINS	
60	40	4	2	0	3	LU	49.70	MILES	CENTRAL IRREGULAR PLAINS	
61	40	5	2	1	1	LU	49.70	MILES	CENTRAL IRREGULAR PLAINS	
62	40	6	2	1	5	LU	49.70	MILES	CENTRAL IRREGULAR PLAINS	
63	40	7	2	1	3	LU	49.70	MILES	CENTRAL IRREGULAR PLAINS	

POTW Discharges to Surface Waters

64	26	1	2	0	3 LU	81.00 MILES	SOUTHWESTERN TABLELANDS
65	26	2	2	0	0 LU	81.00 MILES	SOUTHWESTERN TABLELANDS
66	26	3	2	3	3 LU	81.00 MILES	SOUTHWESTERN TABLELANDS
67	26	4	2	0	2 LU	81.00 MILES	SOUTHWESTERN TABLELANDS
68	26	5	2	1	1 LU	81.00 MILES	SOUTHWESTERN TABLELANDS
69	26	6	2	1	1 LU	81.00 MILES	SOUTHWESTERN TABLELANDS
70	26	7	2	1	4 LU	81.00 MILES	SOUTHWESTERN TABLELANDS
71	27	1	2	0	3 LU	80.10 MILES	CENTRAL GREAT PLAINS
72	27	2	2	0	0 LU	80.10 MILES	CENTRAL GREAT PLAINS
73	27	3	2	3	2 LU	80.10 MILES	CENTRAL GREAT PLAINS
74	27	4	2	0	3 LU	80.10 MILES	CENTRAL GREAT PLAINS
75	27	5	2	1	1 LU	80.10 MILES	CENTRAL GREAT PLAINS
76	27	6	2	1	3 LU	80.10 MILES	CENTRAL GREAT PLAINS
77	27	7	2	1	4 LU	80.10 MILES	CENTRAL GREAT PLAINS
78	27	1	2	0	3 LU	6.00 MILES	CENTRAL GREAT PLAINS
79	27	2	2	0	0 LU	6.00 MILES	CENTRAL GREAT PLAINS
80	27	3	2	3	2 LU	6.00 MILES	CENTRAL GREAT PLAINS
81	27	4	2	0	3 LU	6.00 MILES	CENTRAL GREAT PLAINS
82	27	5	2	3	1 LU	6.00 MILES	CENTRAL GREAT PLAINS
83	27	6	2	1	3 LU	6.00 MILES	CENTRAL GREAT PLAINS
84	27	7	2	1	4 LU	6.00 MILES	CENTRAL GREAT PLAINS
85	29	1	2	0	2 LU	121.50 MILES	CENTRAL OK/TEXAS PLAINS
86	29	2	2	0	0 LU	121.50 MILES	CENTRAL OK/TEXAS PLAINS
87	29	3	2	3	2 LU	121.50 MILES	CENTRAL OK/TEXAS PLAINS
88	29	4	2	0	3 LU	121.50 MILES	CENTRAL OK/TEXAS PLAINS
89	29	5	2	1	1 LU	121.50 MILES	CENTRAL OK/TEXAS PLAINS
90	29	6	2	1	3 LU	121.50 MILES	CENTRAL OK/TEXAS PLAINS
91	29	7	2	1	4 LU	121.50 MILES	CENTRAL OK/TEXAS PLAINS
92	65	1	2	0	1 LU	13.00 MILES	
93	65	2	2	0	0 LU	13.00 MILES	
94	65	3	2	3	2 LU	13.00 MILES	
95	65	4	2	0	5 LU	13.00 MILES	
96	65	5	2	3	1 LU	13.00 MILES	
97	65	6	2	1	1 LU	13.00 MILES	
98	65	7	2	1	1 LU	13.00 MILES	
99	73	1	2	0	1 LU	467.00 MILES	
100	73	2	2	0	0 LU	467.00 MILES	
101	73	3	2	3	2 LU	467.00 MILES	
102	73	4	2	0	5 LU	467.00 MILES	
103	73	5	2	1	1 LU	467.00 MILES	
104	73	6	2	1	1 LU	467.00 MILES	
105	73	7	2	1	1 LU	467.00 MILES	
106	73	1	2	0	1 LU	87.00 MILES	
107	73	2	2	0	0 LU	87.00 MILES	
108	73	3	2	3	2 LU	87.00 MILES	
109	73	4	2	0	5 LU	87.00 MILES	
110	73	5	2	3	1 LU	87.00 MILES	
111	73	6	2	1	1 LU	87.00 MILES	
112	73	7	2	1	1 LU	87.00 MILES	
113	65	1	2	0	1 LU	56.00 MILES	
114	65	2	2	0	0 LU	56.00 MILES	
115	65	3	2	3	2 LU	56.00 MILES	
116	65	4	2	0	5 LU	56.00 MILES	
117	65	5	2	1	1 LU	56.00 MILES	
118	65	6	2	1	1 LU	56.00 MILES	
119	65	7	2	1	1 LU	56.00 MILES	
120	32	1	2	0	2 LU	151.00 MILES	
121	32	2	2	0	0 LU	151.00 MILES	
122	32	3	2	3	5 LU	151.00 MILES	
123	32	4	2	0	4 LU	151.00 MILES	
124	32	5	2	1	1 LU	151.00 MILES	
125	32	6	2	1	2 LU	151.00 MILES	
126	32	7	2	1	4 LU	151.00 MILES	
127	32	1	2	0	2 LU	184.00 MILES	
128	32	2	2	0	0 LU	184.00 MILES	
129	32	3	2	3	5 LU	184.00 MILES	

POTW Discharges to Surface Waters

130	32	4	2	0	4 LU	184.00 MILES
131	32	5	2	2	1 LU	184.00 MILES
132	32	6	2	1	2 LU	184.00 MILES
133	32	7	2	1	4 LU	184.00 MILES
134	74	1	2	0	1 LU	45.00 MILES
135	74	2	2	0	0 LU	45.00 MILES
136	74	3	2	3	2 LU	45.00 MILES
137	74	4	2	0	5 LU	45.00 MILES
138	74	5	2	1	1 LU	45.00 MILES
139	74	6	2	1	1 LU	45.00 MILES
140	74	7	2	1	2 LU	45.00 MILES
141	33	1	2	0	2 LU	358.00 MILES
142	33	2	2	0	0 LU	358.00 MILES
143	33	3	2	3	2 LU	358.00 MILES
144	33	4	2	0	4 LU	358.00 MILES
145	33	5	2	1	1 LU	358.00 MILES
146	33	6	2	1	2 LU	358.00 MILES
147	33	7	2	1	3 LU	358.00 MILES
148	33	1	2	0	2 LU	85.00 MILES
149	33	2	2	0	0 LU	85.00 MILES
150	33	3	2	3	2 LU	85.00 MILES
151	33	4	2	0	4 LU	85.00 MILES
152	33	5	2	1	1 LU	85.00 MILES
153	33	6	2	1	2 LU	85.00 MILES
154	33	7	2	1	3 LU	85.00 MILES
155	65	1	2	0	1 LU	32.00 MILES
156	65	2	2	0	0 LU	32.00 MILES
157	65	3	2	3	2 LU	32.00 MILES
158	65	4	2	0	5 LU	32.00 MILES
159	65	5	2	1	1 LU	32.00 MILES
160	65	6	2	1	4 LU	32.00 MILES
161	65	7	2	1	2 LU	32.00 MILES
162	34	1	2	0	1 LU	623.10 MILES
163	34	2	2	0	0 LU	623.10 MILES
164	34	3	2	3	2 LU	623.10 MILES
165	34	4	2	0	4 LU	623.10 MILES
166	34	5	2	1	1 LU	623.10 MILES
167	34	6	2	1	2 LU	623.10 MILES
168	34	7	2	1	3 LU	623.10 MILES
169	34	1	2	0	1 LU	495.00 MILES
170	34	2	2	0	0 LU	495.00 MILES
171	34	3	2	3	2 LU	495.00 MILES
172	34	4	2	0	4 LU	495.00 MILES
173	34	5	2	3	1 LU	495.00 MILES
174	34	6	2	1	2 LU	495.00 MILES
175	34	7	2	1	3 LU	495.00 MILES
176	24	1	2	0	5 LU	222.00 MILES
177	24	2	2	0	0 LU	222.00 MILES
178	24	3	2	3	5 LU	222.00 MILES
179	24	4	2	0	1 LU	222.00 MILES
180	24	5	2	1	1 LU	222.00 MILES
181	24	6	2	1	4 LU	222.00 MILES
182	24	7	2	1	5 LU	222.00 MILES

RCRA Hazards Waste Sites

ecord#	ec	func	prob	imp	vul	scode	spval	units	substr(sitedesc,1,40)	staff
1	65	1	8	0	1	AU	50.00	ACRES		
2	65	2	8	0	0	AU	50.00	ACRES		
3	65	3	8	2	2	AU	50.00	ACRES		
4	65	4	8	4	5	AU	50.00	ACRES		
5	65	5	8	4	1	AU	50.00	ACRES		
6	65	6	8	4	4	AU	50.00	ACRES		
7	65	7	8	4	2	AU	50.00	ACRES		
8	65	1	8	0	1	AU	18063.00	ACRES		
9	65	2	8	0	0	AU	18063.00	ACRES		
10	65	3	8	1	2	AU	18063.00	ACRES		
11	65	4	8	1	5	AU	18063.00	ACRES		
12	65	5	8	1	1	AU	18063.00	ACRES		
13	65	6	8	1	4	AU	18063.00	ACRES		
14	65	7	8	1	2	AU	18063.00	ACRES		
15	73	1	8	0	1	AU	1750.00	ACRES		
16	73	2	8	0	0	AU	1750.00	ACRES		
17	73	3	8	2	2	AU	1750.00	ACRES		
18	73	4	8	4	5	AU	1750.00	ACRES		
19	73	5	8	4	1	AU	1750.00	ACRES		
20	73	6	8	4	1	AU	1750.00	ACRES		
21	73	7	8	4	1	AU	1750.00	ACRES		
22	73	1	8	0	1	AU	632082.00	ACRES		
23	73	2	8	0	0	AU	632082.00	ACRES		
24	73	3	8	1	2	AU	632082.00	ACRES		
25	73	4	8	1	5	AU	632082.00	ACRES		
26	73	5	8	1	1	AU	632082.00	ACRES		
27	73	6	8	1	1	AU	632082.00	ACRES		
28	73	7	8	1	1	AU	632082.00	ACRES		
29	74	1	8	0	1	AU	300.00	ACRES		
30	74	2	8	0	0	AU	300.00	ACRES		
31	74	3	8	2	2	AU	300.00	ACRES		
32	74	4	8	4	5	AU	300.00	ACRES		
33	74	5	8	4	1	AU	300.00	ACRES		
34	74	6	8	4	1	AU	300.00	ACRES		
35	74	7	8	4	2	AU	300.00	ACRES		
36	74	1	8	0	1	AU	108477.00	ACRES		
37	74	2	8	0	0	AU	108477.00	ACRES		
38	74	3	8	1	2	AU	108477.00	ACRES		
39	74	4	8	1	5	AU	108477.00	ACRES		
40	74	5	8	1	1	AU	108477.00	ACRES		
41	74	6	8	1	1	AU	108477.00	ACRES		
42	74	7	8	1	2	AU	108477.00	ACRES		
43	40	1	8	0	1	AU	450.00	ACRES		
44	40	2	8	0	0	AU	450.00	ACRES		
45	40	3	8	2	3	AU	450.00	ACRES		
46	40	4	8	4	3	AU	450.00	ACRES		
47	40	5	8	4	1	AU	450.00	ACRES		
48	40	6	8	4	5	AU	450.00	ACRES		
49	40	7	8	4	3	AU	450.00	ACRES		
50	40	1	8	0	1	AU	162592.00	ACRES		
51	40	2	8	0	0	AU	162592.00	ACRES		
52	40	3	8	1	3	AU	162592.00	ACRES		
53	40	4	8	1	3	AU	162592.00	ACRES		
54	40	5	8	1	1	AU	162592.00	ACRES		
55	40	6	8	1	5	AU	162592.00	ACRES		
56	40	7	8	1	3	AU	162592.00	ACRES		
57	34	1	8	0	1	AU	6650.00	ACRES		
58	34	2	8	0	0	AU	6650.00	ACRES		
59	34	3	8	2	2	AU	6650.00	ACRES		
60	34	4	8	4	4	AU	6650.00	ACRES		
61	34	5	8	4	1	AU	6650.00	ACRES		
62	34	6	8	4	2	AU	6650.00	ACRES		
63	34	7	8	4	3	AU	6650.00	ACRES		

RCRA Hazards Waste Sites

64	34	1	8	0	1 AU	2402306.00 ACRES
65	34	2	8	0	0 AU	2402306.00 ACRES
66	34	3	8	1	2 AU	2402306.00 ACRES
67	34	4	8	1	4 AU	2402306.00 ACRES
68	34	5	8	1	1 AU	2402306.00 ACRES
69	34	6	8	1	2 AU	2402306.00 ACRES
70	34	7	8	1	3 AU	2402306.00 ACRES
71	32	1	8	0	2 AU	1900.00 ACRES
72	32	2	8	0	0 AU	1900.00 ACRES
73	32	3	8	2	5 AU	1900.00 ACRES
74	32	4	8	4	4 AU	1900.00 ACRES
75	32	5	8	4	1 AU	1900.00 ACRES
76	32	6	8	4	2 AU	1900.00 ACRES
77	32	7	8	4	4 AU	1900.00 ACRES
78	32	1	8	0	2 AU	686444.00 ACRES
79	32	2	8	0	0 AU	686444.00 ACRES
80	32	3	8	1	5 AU	686444.00 ACRES
81	32	4	8	1	4 AU	686444.00 ACRES
82	32	5	8	1	1 AU	686444.00 ACRES
83	32	6	8	1	2 AU	686444.00 ACRES
84	32	7	8	1	4 AU	686444.00 ACRES
85	26	1	8	0	3 AU	50.00 ACRES
86	26	2	8	0	0 AU	50.00 ACRES
87	26	3	8	2	3 AU	50.00 ACRES
88	26	4	8	4	2 AU	50.00 ACRES
89	26	5	8	4	1 AU	50.00 ACRES
90	26	6	8	4	1 AU	50.00 ACRES
91	26	7	8	4	4 AU	50.00 ACRES
92	26	1	8	0	3 AU	18063.00 ACRES
93	26	2	8	0	0 AU	18063.00 ACRES
94	26	3	8	1	3 AU	18063.00 ACRES
95	26	4	8	1	2 AU	18063.00 ACRES
96	26	5	8	1	1 AU	18063.00 ACRES
97	26	6	8	1	1 AU	18063.00 ACRES
98	26	7	8	1	4 AU	18063.00 ACRES
99	27	1	8	0	3 AU	700.00 ACRES
100	27	2	8	0	0 AU	700.00 ACRES
101	27	3	8	2	2 AU	700.00 ACRES
102	27	4	8	4	3 AU	700.00 ACRES
103	27	5	8	4	1 AU	700.00 ACRES
104	27	6	8	4	3 AU	700.00 ACRES
105	27	7	8	4	4 AU	700.00 ACRES
106	27	1	8	0	3 AU	252783.00 ACRES
107	27	2	8	0	0 AU	252783.00 ACRES
108	27	3	8	1	2 AU	252783.00 ACRES
109	27	4	8	1	3 AU	252783.00 ACRES
110	27	5	8	1	1 AU	252783.00 ACRES
111	27	6	8	1	3 AU	252783.00 ACRES
112	27	7	8	1	4 AU	252783.00 ACRES
113	25	1	8	0	5 AU	1200.00 ACRES
114	25	2	8	0	0 AU	1200.00 ACRES
115	25	3	8	2	3 AU	1200.00 ACRES
116	25	4	8	4	2 AU	1200.00 ACRES
117	25	5	8	4	1 AU	1200.00 ACRES
118	25	6	8	4	1 AU	1200.00 ACRES
119	25	7	8	4	4 AU	1200.00 ACRES
120	25	1	8	0	5 AU	433413.00 ACRES
121	25	2	8	0	0 AU	433413.00 ACRES
122	25	3	8	1	3 AU	433413.00 ACRES
123	25	4	8	1	2 AU	433413.00 ACRES
124	25	5	8	1	1 AU	433413.00 ACRES
125	25	6	8	1	1 AU	433413.00 ACRES
126	25	7	8	1	4 AU	433413.00 ACRES
127	24	1	8	0	5 AU	750.00 ACRES
128	24	2	8	0	0 AU	750.00 ACRES
129	24	3	8	2	5 AU	750.00 ACRES

RCRA Hazards Waste Sites

130	24	4	8	4	1 AU	750.00 ACRES
131	24	5	8	4	1 AU	750.00 ACRES
132	24	6	8	4	4 AU	750.00 ACRES
133	24	7	8	4	5 AU	750.00 ACRES
134	24	1	8	0	5 AU	270822.00 ACRES
135	24	2	8	0	0 AU	270822.00 ACRES
136	24	3	8	1	5 AU	270822.00 ACRES
137	24	4	8	1	1 AU	270822.00 ACRES
138	24	5	8	1	1 AU	270822.00 ACRES
139	24	6	8	1	4 AU	270822.00 ACRES
140	24	7	8	1	5 AU	270822.00 ACRES
141	23	1	8	0	4 AU	50.00 ACRES
142	23	2	8	0	0 AU	50.00 ACRES
143	23	3	8	2	5 AU	50.00 ACRES
144	23	4	8	4	1 AU	50.00 ACRES
145	23	5	8	4	5 AU	50.00 ACRES
146	23	6	8	4	5 AU	50.00 ACRES
147	23	7	8	4	3 AU	50.00 ACRES
148	23	1	8	0	4 AU	18063.00 ACRES
149	23	2	8	0	0 AU	18063.00 ACRES
150	23	3	8	1	5 AU	18063.00 ACRES
151	23	4	8	1	1 AU	18063.00 ACRES
152	23	5	8	1	5 AU	18063.00 ACRES
153	23	6	8	1	5 AU	18063.00 ACRES
154	23	7	8	1	3 AU	18063.00 ACRES
155	22	1	8	0	4 AU	500.00 ACRES
156	22	2	8	0	0 AU	500.00 ACRES
157	22	3	8	2	5 AU	500.00 ACRES
158	22	4	8	4	1 AU	500.00 ACRES
159	22	5	8	4	2 AU	500.00 ACRES
160	22	6	8	4	4 AU	500.00 ACRES
161	22	7	8	4	5 AU	500.00 ACRES
162	22	1	8	0	4 AU	180630.00 ACRES
163	22	2	8	0	0 AU	180630.00 ACRES
164	22	3	8	1	5 AU	180630.00 ACRES
165	22	4	8	1	1 AU	180630.00 ACRES
166	22	5	8	1	2 AU	180630.00 ACRES
167	22	6	8	1	4 AU	180630.00 ACRES
168	22	7	8	1	5 AU	180630.00 ACRES
169	29	1	8	0	2 AU	1250.00 ACRES
170	29	2	8	0	0 AU	1250.00 ACRES
171	29	3	8	2	2 AU	1250.00 ACRES
172	29	4	8	4	3 AU	1250.00 ACRES
173	29	5	8	4	1 AU	1250.00 ACRES
174	29	6	8	4	3 AU	1250.00 ACRES
175	29	7	8	4	4 AU	1250.00 ACRES
176	29	1	8	0	2 AU	451452.00 ACRES
177	29	2	8	0	0 AU	451452.00 ACRES
178	29	3	8	1	2 AU	451452.00 ACRES
179	29	4	8	1	3 AU	451452.00 ACRES
180	29	5	8	1	1 AU	451452.00 ACRES
181	29	6	8	1	3 AU	451452.00 ACRES
182	29	7	8	1	4 AU	451452.00 ACRES
183	30	1	8	0	3 AU	250.00 ACRES
184	30	2	8	0	0 AU	250.00 ACRES
185	30	3	8	2	3 AU	250.00 ACRES
186	30	4	8	4	3 AU	250.00 ACRES
187	30	5	8	4	1 AU	250.00 ACRES
188	30	6	8	4	2 AU	250.00 ACRES
189	30	7	8	4	3 AU	250.00 ACRES
190	30	1	8	0	3 AU	90191.00 ACRES
191	30	2	8	0	0 AU	90191.00 ACRES
192	30	3	8	1	3 AU	90191.00 ACRES
193	30	4	8	1	3 AU	90191.00 ACRES
194	30	5	8	1	1 AU	90191.00 ACRES
195	30	6	8	1	2 AU	90191.00 ACRES

RCRA Hazards Waste Sites

196	30	7	8	1	3	AU	90191.00 ACRES
197	31	1	8	0	3	AU	150.00 ACRES
198	31	2	8	0	0	AU	150.00 ACRES
199	31	3	8	2	3	AU	150.00 ACRES
200	31	4	8	4	3	AU	150.00 ACRES
201	31	5	8	4	1	AU	150.00 ACRES
202	31	6	8	4	1	AU	150.00 ACRES
203	31	7	8	4	3	AU	150.00 ACRES
204	31	1	8	0	3	AU	54115.00 ACRES
205	31	2	8	0	0	AU	54115.00 ACRES
206	31	3	8	1	3	AU	54115.00 ACRES
207	31	4	8	1	3	AU	54115.00 ACRES
208	31	5	8	1	1	AU	54115.00 ACRES
209	31	6	8	1	1	AU	54115.00 ACRES
210	31	7	8	1	3	AU	54115.00 ACRES
211	33	1	8	0	2	AU	450.00 ACRES
212	33	2	8	0	0	AU	450.00 ACRES
213	33	3	8	2	2	AU	450.00 ACRES
214	33	4	8	4	4	AU	450.00 ACRES
215	33	5	8	4	1	AU	450.00 ACRES
216	33	6	8	4	2	AU	450.00 ACRES
217	33	7	8	4	3	AU	450.00 ACRES
218	33	1	8	0	2	AU	162592.00 ACRES
219	33	2	8	0	0	AU	162592.00 ACRES
220	33	3	8	1	2	AU	162592.00 ACRES
221	33	4	8	1	4	AU	162592.00 ACRES
222	33	5	8	1	1	AU	162592.00 ACRES
223	33	6	8	1	2	AU	162592.00 ACRES
224	33	7	8	1	3	AU	162592.00 ACRES
225	35	1	8	0	2	AU	2500.00 ACRES
226	35	2	8	0	0	AU	2500.00 ACRES
227	35	3	8	2	3	AU	2500.00 ACRES
228	35	4	8	4	4	AU	2500.00 ACRES
229	35	5	8	4	1	AU	2500.00 ACRES
230	35	6	8	4	2	AU	2500.00 ACRES
231	35	7	8	4	2	AU	2500.00 ACRES
232	35	1	8	0	2	AU	903150.00 ACRES
233	35	2	8	0	0	AU	903150.00 ACRES
234	35	3	8	1	3	AU	903150.00 ACRES
235	35	4	8	1	4	AU	903150.00 ACRES
236	35	5	8	1	1	AU	903150.00 ACRES
237	35	6	8	1	2	AU	903150.00 ACRES
238	35	7	8	1	2	AU	903150.00 ACRES
239	36	1	8	0	2	AU	250.00 ACRES
240	36	2	8	0	0	AU	250.00 ACRES
241	36	3	8	2	3	AU	250.00 ACRES
242	36	4	8	4	4	AU	250.00 ACRES
243	36	5	8	4	1	AU	250.00 ACRES
244	36	6	8	4	3	AU	250.00 ACRES
245	36	7	8	4	2	AU	250.00 ACRES
246	36	1	8	0	2	AU	90191.00 ACRES
247	36	2	8	0	0	AU	90191.00 ACRES
248	36	3	8	1	3	AU	90191.00 ACRES
249	36	4	8	1	4	AU	90191.00 ACRES
250	36	5	8	1	1	AU	90191.00 ACRES
251	36	6	8	1	3	AU	90191.00 ACRES
252	36	7	8	1	2	AU	90191.00 ACRES
253	37	1	8	0	1	AU	100.00 ACRES
254	37	2	8	0	0	AU	100.00 ACRES
255	37	3	8	2	2	AU	100.00 ACRES
256	37	4	8	4	3	AU	100.00 ACRES
257	37	5	8	4	1	AU	100.00 ACRES
258	37	6	8	4	2	AU	100.00 ACRES
259	37	7	8	4	1	AU	100.00 ACRES
260	37	1	8	0	1	AU	36077.00 ACRES
261	37	2	8	0	0	AU	36077.00 ACRES

RCRA Hazards Waste Sites

262	37	3	8	1	2 AU	36077.00 ACRES
263	37	4	8	1	3 AU	36077.00 ACRES
264	37	5	8	1	1 AU	36077.00 ACRES
265	37	6	8	1	2 AU	36077.00 ACRES
266	37	7	8	1	1 AU	36077.00 ACRES
267	39	1	8	0	1 AU	200.00 ACRES
268	39	2	8	0	0 AU	200.00 ACRES
269	39	3	8	2	3 AU	200.00 ACRES
270	39	4	8	4	3 AU	200.00 ACRES
271	39	5	8	4	1 AU	200.00 ACRES
272	39	6	8	4	2 AU	200.00 ACRES
273	39	7	8	4	2 AU	200.00 ACRES
274	39	1	8	0	1 AU	72153.00 ACRES
275	39	2	8	0	0 AU	72153.00 ACRES
276	39	3	8	1	3 AU	72153.00 ACRES
277	39	4	8	1	3 AU	72153.00 ACRES
278	39	5	8	1	1 AU	72153.00 ACRES
279	39	6	8	1	2 AU	72153.00 ACRES
280	39	7	8	1	2 AU	72153.00 ACRES

Silviculture

Record#	ec	func	prob	imp	vul	scode	spval	units	substr(sitedesc,1,40)	staff
1	73	1	22	0	1	AU	1869900.00	ACRES	ARKANSAS	
2	73	2	22	0	0	AU	1869900.00	ACRES	ARKANSAS	
3	73	3	22	1	2	AU	1869900.00	ACRES	ARKANSAS	
4	73	4	22	1	5	AU	1869900.00	ACRES	ARKANSAS	
5	73	5	22	0	1	AU	1869900.00	ACRES	ARKANSAS	
6	73	6	22	1	1	AU	1869900.00	ACRES	ARKANSAS	
7	73	7	22	0	1	AU	1869900.00	ACRES	ARKANSAS	
8	35	1	22	0	2	AU	5618500.00	ACRES	ARKANSAS	
9	35	2	22	0	0	AU	5618500.00	ACRES	ARKANSAS	
10	35	3	22	1	3	AU	5618500.00	ACRES	ARKANSAS	
11	35	4	22	1	4	AU	5618500.00	ACRES	ARKANSAS	
12	35	5	22	0	1	AU	5618500.00	ACRES	ARKANSAS	
13	35	6	22	1	2	AU	5618500.00	ACRES	ARKANSAS	
14	35	7	22	0	2	AU	5618500.00	ACRES	ARKANSAS	
15	36	1	22	0	2	AU	2930000.00	ACRES	ARKANSAS	
16	36	2	22	0	0	AU	2930000.00	ACRES	ARKANSAS	
17	36	3	22	1	3	AU	2930000.00	ACRES	ARKANSAS	
18	36	4	22	1	4	AU	2930000.00	ACRES	ARKANSAS	
19	36	5	22	0	1	AU	2930000.00	ACRES	ARKANSAS	
20	36	6	22	1	3	AU	2930000.00	ACRES	ARKANSAS	
21	36	7	22	0	2	AU	2930000.00	ACRES	ARKANSAS	
22	37	1	22	0	1	AU	1880900.00	ACRES	ARKANSAS	
23	37	2	22	0	0	AU	1880900.00	ACRES	ARKANSAS	
24	37	3	22	1	2	AU	1880900.00	ACRES	ARKANSAS	
25	37	4	22	1	3	AU	1880900.00	ACRES	ARKANSAS	
26	37	5	22	0	1	AU	1880900.00	ACRES	ARKANSAS	
27	37	6	22	1	2	AU	1880900.00	ACRES	ARKANSAS	
28	37	7	22	0	1	AU	1880900.00	ACRES	ARKANSAS	
29	38	1	22	0	1	AU	1880900.00	ACRES	ARKANSAS	
30	38	2	22	0	0	AU	1880900.00	ACRES	ARKANSAS	
31	38	3	22	1	3	AU	1880900.00	ACRES	ARKANSAS	
32	38	4	22	1	3	AU	1880900.00	ACRES	ARKANSAS	
33	38	5	22	0	1	AU	1880900.00	ACRES	ARKANSAS	
34	38	6	22	1	3	AU	1880900.00	ACRES	ARKANSAS	
35	38	7	22	0	2	AU	1880900.00	ACRES	ARKANSAS	
36	39	1	22	0	1	AU	1880900.00	ACRES	ARKANSAS	
37	39	2	22	0	0	AU	1880900.00	ACRES	ARKANSAS	
38	39	3	22	1	3	AU	1880900.00	ACRES	ARKANSAS	
39	39	4	22	1	3	AU	1880900.00	ACRES	ARKANSAS	
40	39	5	22	0	1	AU	1880900.00	ACRES	ARKANSAS	
41	39	6	22	1	2	AU	1880900.00	ACRES	ARKANSAS	
42	39	7	22	0	2	AU	1880900.00	ACRES	ARKANSAS	
43	73	1	22	0	1	AU	4321000.00	ACRES	LOUISIANA	
44	73	2	22	0	0	AU	4321000.00	ACRES	LOUISIANA	
45	73	3	22	1	2	AU	4321000.00	ACRES	LOUISIANA	
46	73	4	22	1	5	AU	4321000.00	ACRES	LOUISIANA	
47	73	5	22	0	1	AU	4321000.00	ACRES	LOUISIANA	
48	73	6	22	1	1	AU	4321000.00	ACRES	LOUISIANA	
49	73	7	22	0	1	AU	4321000.00	ACRES	LOUISIANA	
50	35	1	22	0	2	AU	8081700.00	ACRES	LOUISIANA	
51	35	2	22	0	0	AU	8081700.00	ACRES	LOUISIANA	
52	35	3	22	1	3	AU	8081700.00	ACRES	LOUISIANA	
53	35	4	22	1	4	AU	8081700.00	ACRES	LOUISIANA	
54	35	5	22	0	1	AU	8081700.00	ACRES	LOUISIANA	
55	35	6	22	1	2	AU	8081700.00	ACRES	LOUISIANA	
56	35	7	22	0	2	AU	8081700.00	ACRES	LOUISIANA	
57	35	1	22	0	2	AU	10590100.00	ACRES	TEXAS	
58	35	2	22	0	0	AU	10590100.00	ACRES	TEXAS	
59	35	3	22	1	3	AU	10590100.00	ACRES	TEXAS	
60	35	4	22	1	4	AU	10590100.00	ACRES	TEXAS	
61	35	5	22	0	1	AU	10590100.00	ACRES	TEXAS	
62	35	6	22	1	2	AU	10590100.00	ACRES	TEXAS	
63	35	7	22	0	2	AU	10590100.00	ACRES	TEXAS	

Silviculture

37	1	22	0	1 AU	422100.00 ACRES	OKLAHOMA
65	37	2	22	0 0 AU	422100.00 ACRES	OKLAHOMA
66	37	3	22	1 2 AU	422100.00 ACRES	OKLAHOMA
67	37	4	22	1 3 AU	422100.00 ACRES	OKLAHOMA
68	37	5	22	0 1 AU	422100.00 ACRES	OKLAHOMA
69	37	6	22	1 2 AU	422100.00 ACRES	OKLAHOMA
70	37	7	22	0 1 AU	422100.00 ACRES	OKLAHOMA
71	38	1	22	0 1 AU	422100.00 ACRES	OKLAHOMA
72	38	2	22	0 0 AU	422100.00 ACRES	OKLAHOMA
73	38	3	22	1 3 AU	422100.00 ACRES	OKLAHOMA
74	38	4	22	1 3 AU	422100.00 ACRES	OKLAHOMA
75	38	5	22	0 1 AU	422100.00 ACRES	OKLAHOMA
76	38	6	22	1 3 AU	422100.00 ACRES	OKLAHOMA
77	38	7	22	0 2 AU	422100.00 ACRES	OKLAHOMA
78	39	1	22	0 1 AU	422100.00 ACRES	OKLAHOMA
79	39	2	22	0 0 AU	422100.00 ACRES	OKLAHOMA
80	39	3	22	1 3 AU	422100.00 ACRES	OKLAHOMA
81	39	4	22	1 3 AU	422100.00 ACRES	OKLAHOMA
82	39	5	22	0 1 AU	422100.00 ACRES	OKLAHOMA
83	39	6	22	1 2 AU	422100.00 ACRES	OKLAHOMA
84	39	7	22	0 2 AU	422100.00 ACRES	OKLAHOMA
85	35	1	22	0 2 AU	3217100.00 ACRES	OKLAHOMA
86	35	2	22	0 0 AU	3217100.00 ACRES	OKLAHOMA
87	35	3	22	1 3 AU	3217100.00 ACRES	OKLAHOMA
88	35	4	22	1 4 AU	3217100.00 ACRES	OKLAHOMA
89	35	5	22	0 1 AU	3217100.00 ACRES	OKLAHOMA
90	35	6	22	1 2 AU	3217100.00 ACRES	OKLAHOMA
91	35	7	22	0 2 AU	3217100.00 ACRES	OKLAHOMA
92	35	1	22	0 2 AU	375000.00 ACRES	LOUISIANA
93	35	2	22	0 0 AU	375000.00 ACRES	LOUISIANA
94	35	3	22	3 3 AU	375000.00 ACRES	LOUISIANA
95	35	4	22	2 4 AU	375000.00 ACRES	LOUISIANA
96	35	5	22	0 1 AU	375000.00 ACRES	LOUISIANA
97	35	6	22	4 2 AU	375000.00 ACRES	LOUISIANA
98	35	7	22	0 2 AU	375000.00 ACRES	LOUISIANA
99	73	1	22	0 1 AU	375000.00 ACRES	LOUISIANA
100	73	2	22	0 0 AU	375000.00 ACRES	LOUISIANA
101	73	3	22	3 2 AU	375000.00 ACRES	LOUISIANA
102	73	4	22	2 5 AU	375000.00 ACRES	LOUISIANA
103	73	5	22	0 1 AU	375000.00 ACRES	LOUISIANA
104	73	6	22	4 1 AU	375000.00 ACRES	LOUISIANA
105	73	7	22	0 1 AU	375000.00 ACRES	LOUISIANA
106	36	1	22	0 2 AU	55000.00 ACRES	OKLAHOMA
107	36	2	22	0 0 AU	55000.00 ACRES	OKLAHOMA
108	36	3	22	3 3 AU	55000.00 ACRES	OKLAHOMA
109	36	4	22	2 4 AU	55000.00 ACRES	OKLAHOMA
110	36	5	22	0 1 AU	55000.00 ACRES	OKLAHOMA
111	36	6	22	4 3 AU	55000.00 ACRES	OKLAHOMA
112	36	7	22	0 2 AU	55000.00 ACRES	OKLAHOMA
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117	37	5	22	0 1 AU	55000.00 ACRES	OKLAHOMA
118	37	6	22	4 2 AU	55000.00 ACRES	OKLAHOMA
119	37	7	22	0 1 AU	55000.00 ACRES	OKLAHOMA
120	35	1	22	0 2 AU	2727250.00 ACRES	EAST TEXAS
121	35	2	22	0 0 AU	2727250.00 ACRES	EAST TEXAS
122	35	3	22	3 3 AU	2727250.00 ACRES	EAST TEXAS
123	35	4	22	2 4 AU	2727250.00 ACRES	EAST TEXAS
124	35	5	22	0 1 AU	2727250.00 ACRES	EAST TEXAS
125	35	6	22	4 2 AU	2727250.00 ACRES	EAST TEXAS
126	35	7	22	0 2 AU	2727250.00 ACRES	EAST TEXAS
127	38	1	22	0 1 AU	92395.00 ACRES	ARKANSAS
128	38	2	22	0 0 AU	92395.00 ACRES	ARKANSAS
129	38	3	22	3 2 AU	92395.00 ACRES	ARKANSAS

Urbanization

ecord#	ec	func	prob	imp	vul	scode	spval	units	substr(sitedesc,1,40)	staff
1	22	1	22	4	4	AU	249600.00	ACRES		
2	22	2	22	0	0	AU	249600.00	ACRES		
3	22	3	22	3	5	AU	249600.00	ACRES		
4	22	4	22	2	1	AU	249600.00	ACRES		
5	22	5	22	4	2	AU	249600.00	ACRES		
6	22	6	22	4	4	AU	249600.00	ACRES		
7	22	7	22	4	5	AU	249600.00	ACRES		
8	24	1	22	4	5	AU	66560.00	ACRES		
9	24	2	22	0	0	AU	66560.00	ACRES		
10	24	3	22	3	5	AU	66560.00	ACRES		
11	24	4	22	2	1	AU	66560.00	ACRES		
12	24	5	22	4	1	AU	66560.00	ACRES		
13	24	6	22	4	4	AU	66560.00	ACRES		
14	24	7	22	4	5	AU	66560.00	ACRES		
15	25	1	22	4	5	AU	268800.00	ACRES		
16	25	2	22	0	0	AU	268800.00	ACRES		
17	25	3	22	3	3	AU	268800.00	ACRES		
18	25	4	22	2	2	AU	268800.00	ACRES		
19	25	5	22	4	1	AU	268800.00	ACRES		
20	25	6	22	4	1	AU	268800.00	ACRES		
21	25	7	22	4	4	AU	268800.00	ACRES		
22	27	1	22	4	3	AU	201600.00	ACRES		
23	27	2	22	0	0	AU	201600.00	ACRES		
24	27	3	22	3	2	AU	201600.00	ACRES		
25	27	4	22	2	3	AU	201600.00	ACRES		
26	27	5	22	4	1	AU	201600.00	ACRES		
27	27	6	22	4	3	AU	201600.00	ACRES		
28	27	7	22	4	4	AU	201600.00	ACRES		
29	29	1	22	4	2	AU	101120.00	ACRES		
30	29	2	22	0	0	AU	101120.00	ACRES		
31	29	3	22	3	2	AU	101120.00	ACRES		
32	29	4	22	2	3	AU	101120.00	ACRES		
33	29	5	22	4	1	AU	101120.00	ACRES		
34	29	6	22	4	3	AU	101120.00	ACRES		
35	29	7	22	4	4	AU	101120.00	ACRES		
36	31	1	22	4	3	AU	88960.00	ACRES		
37	31	2	22	0	0	AU	88960.00	ACRES		
38	31	3	22	3	3	AU	88960.00	ACRES		
39	31	4	22	2	3	AU	88960.00	ACRES		
40	31	5	22	4	1	AU	88960.00	ACRES		
41	31	6	22	4	1	AU	88960.00	ACRES		
42	31	7	22	4	3	AU	88960.00	ACRES		
43	32	1	22	4	2	AU	1480960.00	ACRES		
44	32	2	22	0	0	AU	1480960.00	ACRES		
45	32	3	22	3	5	AU	1480960.00	ACRES		
46	32	4	22	2	4	AU	1480960.00	ACRES		
47	32	5	22	4	1	AU	1480960.00	ACRES		
48	32	6	22	4	2	AU	1480960.00	ACRES		
49	32	7	22	4	4	AU	1480960.00	ACRES		
50	33	1	22	4	2	AU	81280.00	ACRES		
51	33	2	22	0	0	AU	81280.00	ACRES		
52	33	3	22	3	2	AU	81280.00	ACRES		
53	33	4	22	2	4	AU	81280.00	ACRES		
54	33	5	22	4	1	AU	81280.00	ACRES		
55	33	6	22	4	2	AU	81280.00	ACRES		
56	33	7	22	4	3	AU	81280.00	ACRES		
57	34	1	22	4	1	AU	504960.00	ACRES		
58	34	2	22	0	0	AU	504960.00	ACRES		
59	34	3	22	3	2	AU	504960.00	ACRES		
60	34	4	22	2	4	AU	504960.00	ACRES		
61	34	5	22	4	1	AU	504960.00	ACRES		
62	34	6	22	4	2	AU	504960.00	ACRES		
63	34	7	22	4	3	AU	504960.00	ACRES		

Urbanization

35	1	22	4	2 AU	270720.00 ACRES
35	2	22	0	0 AU	270720.00 ACRES
35	3	22	3	3 AU	270720.00 ACRES
35	4	22	2	4 AU	270720.00 ACRES
35	5	22	4	4 AU	270720.00 ACRES
35	6	22	4	2 AU	270720.00 ACRES
35	7	22	4	2 AU	270720.00 ACRES
36	1	22	4	2 AU	117120.00 ACRES
36	2	22	0	0 AU	117120.00 ACRES
36	3	22	3	3 AU	117120.00 ACRES
36	4	22	2	4 AU	117120.00 ACRES
36	5	22	4	1 AU	117120.00 ACRES
36	6	22	4	3 AU	117120.00 ACRES
36	7	22	4	2 AU	117120.00 ACRES
37	1	22	4	1 AU	58880.00 ACRES
37	2	22	0	0 AU	58880.00 ACRES
37	3	22	3	2 AU	58880.00 ACRES
37	4	22	2	3 AU	58880.00 ACRES
37	5	22	4	1 AU	58880.00 ACRES
37	6	22	4	2 AU	58880.00 ACRES
37	7	22	4	1 AU	58880.00 ACRES
39	1	22	4	1 AU	15360.00 ACRES
39	2	22	0	0 AU	15360.00 ACRES
39	3	22	3	3 AU	15360.00 ACRES
39	4	22	2	3 AU	15360.00 ACRES
39	5	22	4	1 AU	15360.00 ACRES
39	6	22	4	3 AU	15360.00 ACRES
39	7	22	4	2 AU	15360.00 ACRES
40	1	22	4	1 AU	96000.00 ACRES
40	2	22	0	0 AU	96000.00 ACRES
40	3	22	3	3 AU	96000.00 ACRES
40	4	22	2	3 AU	96000.00 ACRES
40	5	22	4	1 AU	96000.00 ACRES
40	6	22	4	5 AU	96000.00 ACRES
40	7	22	4	3 AU	96000.00 ACRES
73	1	22	4	1 AU	278400.00 ACRES
73	2	22	0	0 AU	278400.00 ACRES
73	3	22	3	2 AU	278400.00 ACRES
73	4	22	2	5 AU	278400.00 ACRES
73	5	22	4	1 AU	278400.00 ACRES
73	6	22	4	1 AU	278400.00 ACRES
73	7	22	4	1 AU	278400.00 ACRES

ATTACHMENT I

ATTACHMENT I

GLOSSARY

Abiotic - Devoid of life; nonliving.

Abiotic Stability - The ability of abiotic components of an ecosystem to withstand or recover from an impact from a stressor.

Aquatic Organism Production - The ability of an ecosystem to maintain diverse and stable communities of aquatic organisms.

Area of Impact - An area subjected to a given stressor measured in acres, hectares, sq.km., stream miles, etc.

Areal - Any particular extent of space or surface area as a geographical region.

Biotic - Pertaining to life or living organisms, caused or produced by or comprising living organisms.

Cumulative Impact - Is the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or Non-federal) or person undertakes such other actions (NEPA, 1970).

Degree of Impact - The severity (intensity and duration) with which a stressor acts on an indicator, on a relative scale. This is a characteristic of the problem or stressor.

Degree of Vulnerability - See Vulnerability.

Diversity - A measure of biotic stability, as measured by species richness and populations numbers.

Ecological Risk Assessment - Ecological risk assessment is a procedure for estimating the probability of and severity of adverse effects on species, biotic communities, and ecosystem structure and function.

Ecological Risk Index - Numerical index which depicts an ecological risk value for use in relative ranking.

Ecoregion - Large scale regions (15,000 - 33,000 sq.km.) delineated on the basis of patterns of climate, soils, geology, vegetation, and physiography (Omernick, 1987).

Ecosystem - Includes the biotic community and the abiotic environment for a given area.

Ephemeral - Relating to a stream or a portion of a stream that flows only in direct response to precipitation and receives little or no water from springs or no long-continued supply from snow or other sources and its channel is at all times above the water table; lasting for only a day, short-lived or transient.

Filtering and detoxifying of pollutants - The ability of an ecoregion to remove or make harmless contaminants, excess nutrients, or particulate matter from air, water or soils. The assimilative capacity of an ecoregion is determined by soils, topography, micro-organism populations, vegetative uptake stream flow and wind velocities.

Hydrology - For purposes of this study the mechanism for distributing water and nutrients across the surface of the landscape dealing only with surface and groundwater available to non-human populations within an ecoregion.

Geographic Information System (GIS) - Computerized mapping system used to automate, manipulate, analyze and display geographic data in digital form. The major advantage of a geographic information system is that it allows you to identify the spatial relationships between map features. In the ecological report the GIS maps depict environmental risk index values for each ecoregion by program stressor.

Primary Production - For purposes of this study, the conversion of sunlight into organic matter which is available to non-human populations. The indicator of impact to primary production is vegetative populations which generally produce food for non-human populations.

Residual Risk - The risk that remains given current levels of control in place and current levels of non-compliance with regulatory requirements.

Residual Risk Formula -
$$ERI = \sum_{j=1}^v \sum_{i=0}^{n-1} A_{ji}/A_E D_{ji} Dv_j$$

Stability - Resiliency or ability of an ecosystem (biotic and abiotic) components to withstand or recover from an impact from a stressor.

Stream Density - Number of stream miles per square miles of drainage area.

Soil Production - This is the ability of an ecoregion to maintain a dynamic soil environment. In a healthy soil environment weathering of sediments/lithologies, growth of soil macro- and micro-biota, and the degradation of organic material continue at a rate where inputs are balanced against outputs. When soils are stressed by environmental effects, organic matter may be lost, biota is stressed or eliminated and weathering rates and products are effected. A stressed soil will have a reduced capacity to produce normal soil gases, and act as a filter against contamination of groundwater.

Standard Metropolitan Statistical Area (SMSA) - To be designated as a Standard Metropolitan Statistical Area in 1980 an area had to have at least one city with a population of 50,000 or more or have a total urbanized population of 100,000 (75,000 in New England). The standards for SMSA designation specify that the counties which include the central city and adjacent counties, if they are at least 50% urbanized, be included in the SMSA. After 1980, the term "statistical" was dropped in SMSA, therefore the new term is SMA.

Terrestrial Organism Production - The ability of an ecosystem to maintain diverse and stable communities of terrestrial organisms.

Vulnerability - Unique characteristics of each ecoregion which determines its sensitivity to a stressor. In this study there were a variety of indicators used to represent vulnerability including endangered species, primary productivity rates, stream flows, and wind velocities.