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EJ INDEX METHODOLOGY

The information used in this methodology is based on 2000 USBOC block level data for ethnicity (Public Law 94-171) and block group level (Summary Tape File 3A) for income data. Current EPA computer-assisted environmental assessments are limited to a radial analysis. In order to better analyze the EJ issues for Segment F-2, radial analysis was performed from two points: one close to the western terminus (at SH 249) and the other toward the eastern terminus (at US 45) of Segment F2 (this is represented by the a and b extension on the name of each map). Although a 1-square-mile buffer is presented (the inner most circle) on each EJ map only the 50-square mile analysis (referred to as the “study area” below) is included in the discussion. However, it is important to note that the two 50-square mile area circles cover relatively large areas that are outside of the Segment F-2 project area, and therefore, the results of these maps incorporate USBOC data for persons living within census blocks and block groups occurring outside the project area. The result of this caveat is that the EJ Index methodology does not generate results that fully represent the population living within the project area, and the EJ Index Methodology is not as accurate as the Census Tract Analysis (described in Volume II, Section 4.3.1.2 Environmental Justice). Therefore, the EJ Index Methodology should be used as a starting point only, while the results of the Census Tract Analysis should be used to determine project area’s potential for disproportionate effects to ethnic minorities and poverty status persons.

The EJ Index Methodology developed by EPA Region 6 is a modification of the Region’s Human Health Risk Index Formula. The methodology defines demographic criteria by using a geographic information system (GIS) and census data to analyze the buffer area. Using an EPA risk-based algorithm, the EJ Formula calculates the degree of vulnerability for the area based on population density and two socioeconomic criteria: a community’s percentage minority representation and percentage of economically stressed households. This information is then compared with the calculated state index and a ranking criterion is established. The study area was evaluated using the formula and ranked on a scale of 0 to 100 on a logarithmic scale. Higher scores indicate a greater potential for disproportionate impacts. Discussions with the EPA – Region 6 staff indicate that an EJ Index score below 4 indicates a low to moderate potential for disproportionate effects to ethnic minorities or poverty status persons. The three levels of analysis provided are the Minority Status Degree of Vulnerability; the Economic Status Degree of Vulnerability; and the Potential Environmental Justice Index.

Minority Status Degree of Vulnerability

The Minority Status - Degree of Vulnerability (DVMAV) maps (F2A and F2B) show minority status results by census block. Comparing the study area’s percentage of minority population (based on census block data) with the State percentage of 47.6 percent derives this factor. For the study area, the percentage of people of minority status was 18.4 percent (average of the two DVMAV maps) in 2000. Minority status is defined to include all non-white persons, including all non-white Hispanic-origin persons.

Economic Status Degree of Vulnerability

The Economic Status – Degree of Vulnerability (DVECO) maps (F2A and F2B) show the potential degree of vulnerability based on household income (the risk group is defined as households who had incomes less than \$20,000 in 1999). The Texas percentage of such households is 23.6 percent. In



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2000, the study area had 7.4 percent (average of the two DVECO maps) of the population living below the poverty level.

Potential Environmental Justice Index

The Potential Environmental Justice Index (EJ) maps (F2A and F2B) show the potential EJ indices, which are composite indices incorporating population density, income and ethnicity. The potential EJ index for the study area was ranked at 2.5 (average of the two EJ maps), which is considered to be a low to moderate ranking. However, this ranking is less accurate than the Census Tract Analysis. Therefore the Census Tract Analysis (presented in Volume II, Section 4.3.1.2 Environmental Justice) should be used to determine the potential for disproportionate effects to ethnic minorities and poverty status persons living within the project area.

POTENTIAL ENVIRONMENTAL JUSTICE (EJ) INDEX PILOT

Date : 11 Mar 03 13:32:16 Tuesday
Requestor : PEET/CARNEY 6EN-X
Site Id Number : TXHOUHWF2A
Site Name : GRAND PARKWAY SEGMENT F2A
County : HARRIS
State/County FIPS Code : 48201
Location : -95 33 5.510 30 4 35.100
Quality Assurance Resource : 1

GRAND PARKWAY SEGMENT F2A
1990 - 50 square mile study area

Minority Ranking Value (DVMAV) : 1 Percent Minority = 12.2
Economic Ranking Value (DVECO) : 1 Percent Economically Stressed = 8.5
Population Ranking Value (PF) : 2 Total Population = 30699

Potential Environmental Justice Index (DVMAV * DVECO * PF) = 2

GRAND PARKWAY SEGMENT F2A
2000 - 50 square mile study area

Minority Ranking Value (DVMAV) : 1 Percent Minority = 18.4
Economic Ranking Value (DVECO) : 1 Percent Economically Stressed = 7.6
Population Ranking Value (PF) : 2 Total Population = 43253

Potential Environmental Justice Index (DVMAV * DVECO * PF) = 2

GRAND PARKWAY SEGMENT F2A
1990 - 1 square mile study area

Minority Ranking Value (DVMAV) : 1 Percent Minority = 8.2
Economic Ranking Value (DVECO) : 1 Percent Economically Stressed = 6.5
Population Ranking Value (PF) : 1 Total Population = 98

Potential Environmental Justice Index (DVMAV * DVECO * PF) = 1

GRAND PARKWAY SEGMENT F2A
2000 - 1 square mile study area

Minority Ranking Value (DVMAV) : 1 Percent Minority = 21.5
Economic Ranking Value (DVECO) : 1 Percent Economically Stressed = 8.7
Population Ranking Value (PF) : 2 Total Population = 340

Potential Environmental Justice Index (DVMAV * DVECO * PF) = 2

POTENTIAL ENVIRONMENTAL JUSTICE (EJ) INDEX PILOT

The Potential Environmental Justice Index, or the independent subfactors comprising the index, should be used as a DEMOGRAPHIC CORRELATION VARIABLE for studies conducted by the PROGRAMS. These studies may be used to measure Agency policies or procedures regarding sociological equity for enforcement or permitting activities. The information given in this report does not represent the final analysis of a site in regard to Environmental Justice or RISK. The indices and raw data reported are indicators of vulnerability for subgroups of people to other stressors.

METHODOLOGY CRITERIA

Environmental Justice Indexes are indicators of potential EJ concern. 1990 Census data for a Study Area is evaluated and ranked in relationship to state percentages. Ranking variables are multiplied to produce an index for prioritizing applications. The ranking variables are:
 ~ Minority Status, Degree of Vulnerability (DVMAV),
 ~ Economic Status, Degree of Vulnerability (DVECO),
 ~ and Total Population, Population Factor (PF).

~MINORITY STATUS (DVMAV) - In 1990, the percent minority for TX is 39.4%.
 In 2000, the percent minority for TX is 47.6%.

~ECONOMIC STATUS (DVECO) - In 1990, Economically Stressed was defined as Households making less than \$15,000 a year. For TX the percent economically stressed was 27.6%.
 In 2000, Economically Stressed is defined as households making less than \$20,000 a year.
 For TX the percent economically stressed was 23.6%.

The Methodology for ranking values associated with Degrees of vulnerability is

Ranking	Criteria
1	<= the State Percentage
2	> the State Percentage but <= 1.33 times the State Percentage
3	> 1.33 times the State Percentage but <= 1.66 times the State Percentage
4	> 1.66 times the State Percentage but <= 1.99 times the State Percentage
5	>= 2 times the State Percentage

~POPULATION RANKING FACTOR Total Population is ranked using the following criteria.

Ranking	Criteria	(evaluated on a 1 square mile basis)
0	Total Population = 0	
1	Total Population > 0 and < 200	
2	Total Population > 200 and < 1000	
3	Total Population > 1000 and < 5000	
4	Total Population > 5000	

Reference for Quality Assurance Resources

1	Personal Verification	7	AIRS
2	Reconciliation with Quad maps	8	PCS
3	Reported from archived files	9	GIS Verified
4	TRIS	10	Professional Judgement
5	RCRIS	11	Federal Facility Tracking System
6	CERCLIS	12	Dun & Bradstreet

POTENTIAL ENVIRONMENTAL JUSTICE (EJ) INDEX PILOT

Date : 11 Mar 03 13:40:09 Tuesday
Requestor : PEET/CARNEY 6EN-X
Site Id Number : TXHOUHWYF2B
Site Name : GRAND PARKWAY SEGMENT F2B
County : HARRIS
State/County FIPS Code : 48201
Location : -95 29 7.010 30 4 45.100
Quality Assurance Resource : 1

GRAND PARKWAY SEGMENT F2B
1990 - 50 square mile study area

Minority Ranking Value (DVMAV) : 1 Percent Minority = 12.5
Economic Ranking Value (DVECO) : 1 Percent Economically Stressed = 8.1
Population Ranking Value (PF) : 2 Total Population = 48764

Potential Environmental Justice Index (DVMAV * DVECO * PF) = 2

GRAND PARKWAY SEGMENT F2B
2000 - 50 square mile study area

Minority Ranking Value (DVMAV) : 1 Percent Minority = 18
Economic Ranking Value (DVECO) : 1 Percent Economically Stressed = 7.1
Population Ranking Value (PF) : 3 Total Population = 62241

Potential Environmental Justice Index (DVMAV * DVECO * PF) = 3

GRAND PARKWAY SEGMENT F2B
1990 - 1 square mile study area

Minority Ranking Value (DVMAV) : 1 Percent Minority = 9.6
Economic Ranking Value (DVECO) : 1 Percent Economically Stressed = 9.2
Population Ranking Value (PF) : 1 Total Population = 198

Potential Environmental Justice Index (DVMAV * DVECO * PF) = 1

GRAND PARKWAY SEGMENT F2B
2000 - 1 square mile study area

Minority Ranking Value (DVMAV) : 1 Percent Minority = 14.4
Economic Ranking Value (DVECO) : 1 Percent Economically Stressed = 17
Population Ranking Value (PF) : 2 Total Population = 257

Potential Environmental Justice Index (DVMAV * DVECO * PF) = 2

POTENTIAL ENVIRONMENTAL JUSTICE (EJ) INDEX PILOT

The Potential Environmental Justice Index, or the independent subfactors comprising the index, should be used as a DEMOGRAPHIC CORRELATION VARIABLE for studies conducted by the PROGRAMS. These studies may be used to measure Agency policies or procedures regarding sociological equity for enforcement or permitting activities. The information given in this report does not represent the final analysis of a site in regard to Environmental Justice or RISK. The indices and raw data reported are indicators of vulnerability for subgroups of people to other stressors.

METHODOLOGY CRITERIA

Environmental Justice Indexes are indicators of potential EJ concern. 1990 Census data for a Study Area is evaluated and ranked in relationship to state percentages. Ranking variables are multiplied to produce an index for prioritizing applications. The ranking variables are:
~ Minority Status, Degree of Vulnerability (DVMAV),
~ Economic Status, Degree of Vulnerability (DVECO),
~ and Total Population, Population Factor (PF).

~MINORITY STATUS (DVMAV) - In 1990, the percent minority for TX is 39.4%. In 2000, the percent minority for TX is 47.6%.

~ECONOMIC STATUS (DVECO) - In 1990, Economically Stressed was defined as Households making less than \$15,000 a year. For TX the percent economically stressed was 27.6%. In 2000, Economically Stressed is defined as households making less than \$20,000 a year. For TX the percent economically stressed was 23.6%.

The Methodology for ranking values associated with Degrees of vulnerability is

Ranking	Criteria
1	<= the State Percentage
2	> the State Percentage but <= 1.33 times the State Percentage
3	> 1.33 times the State Percentage but <= 1.66 times the State Percentage
4	> 1.66 times the State Percentage but <= 1.99 times the State Percentage
5	>= 2 times the State Percentage

~POPULATION RANKING FACTOR Total Population is ranked using the following criteria.

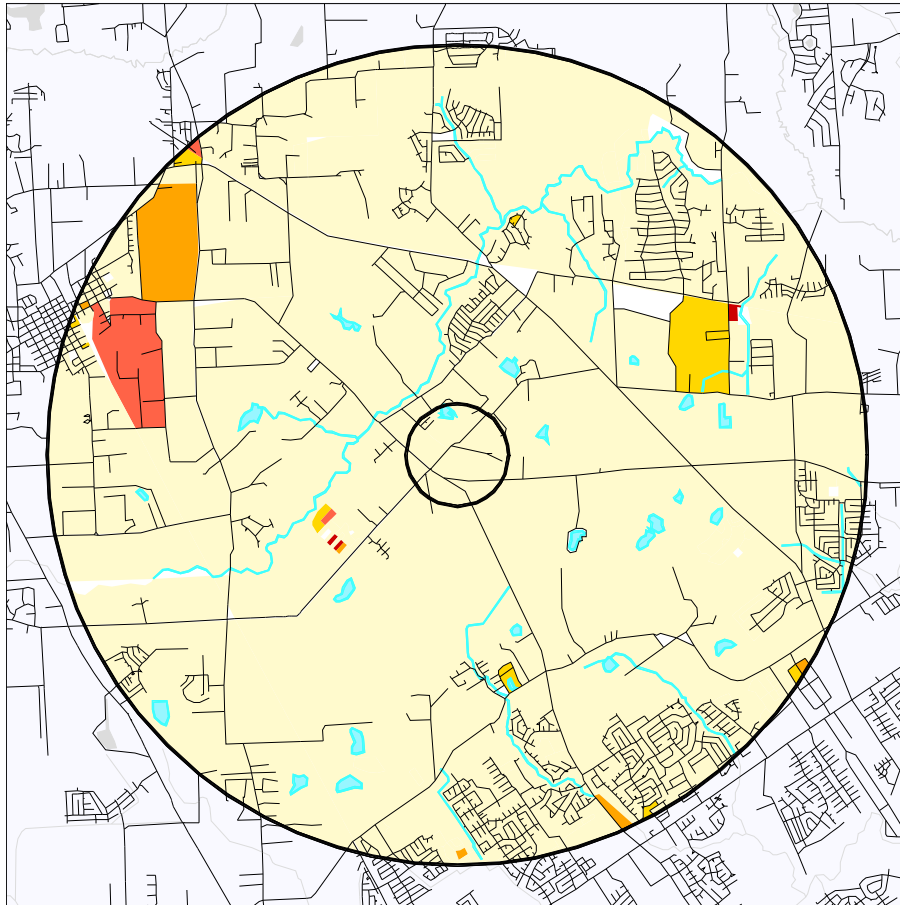
Ranking	Criteria	(evaluated on a 1 square mile basis)
0	Total Population = 0	
1	Total Population > 0 and < 200	
2	Total Population > 200 and < 1000	
3	Total Population > 1000 and < 5000	
4	Total Population > 5000	

Reference for Quality Assurance Resources

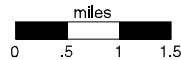
- | | | | |
|---|-------------------------------|----|----------------------------------|
| 1 | Personal Verification | 7 | AIRS |
| 2 | Reconciliation with Quad maps | 8 | PCS |
| 3 | Reported from archived files | 9 | GIS Verified |
| 4 | TRIS | 10 | Professional Judgement |
| 5 | RCRIS | 11 | Federal Facility Tracking System |
| 6 | CERCLIS | 12 | Dun & Bradstreet |

Grand Parkway Segment F2A, HOUSTON, TX

Minority Status - Degree of Vulnerability (DVMAV)

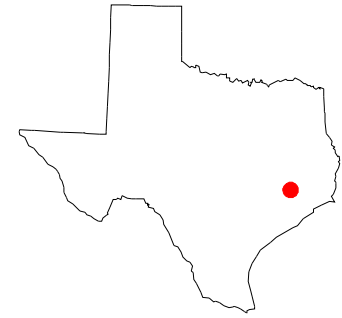


Longitude: -95 33 5.51 Latitude: 30 4 35.1



Percent Minority by Census Block
State Percentage = 47.6

- ≤ the State Percentage
- > the State Percentage,
≤ 1.33 times the State Percentage
- > 1.33 times the State Percentage,
≤ 1.66 times the State Percentage
- > 1.66 times the State Percentage,
≤ 2 times the State Percentage
- > 2 times the State Percentage



Potential Environmental
Justice Index for
Two Study Areas

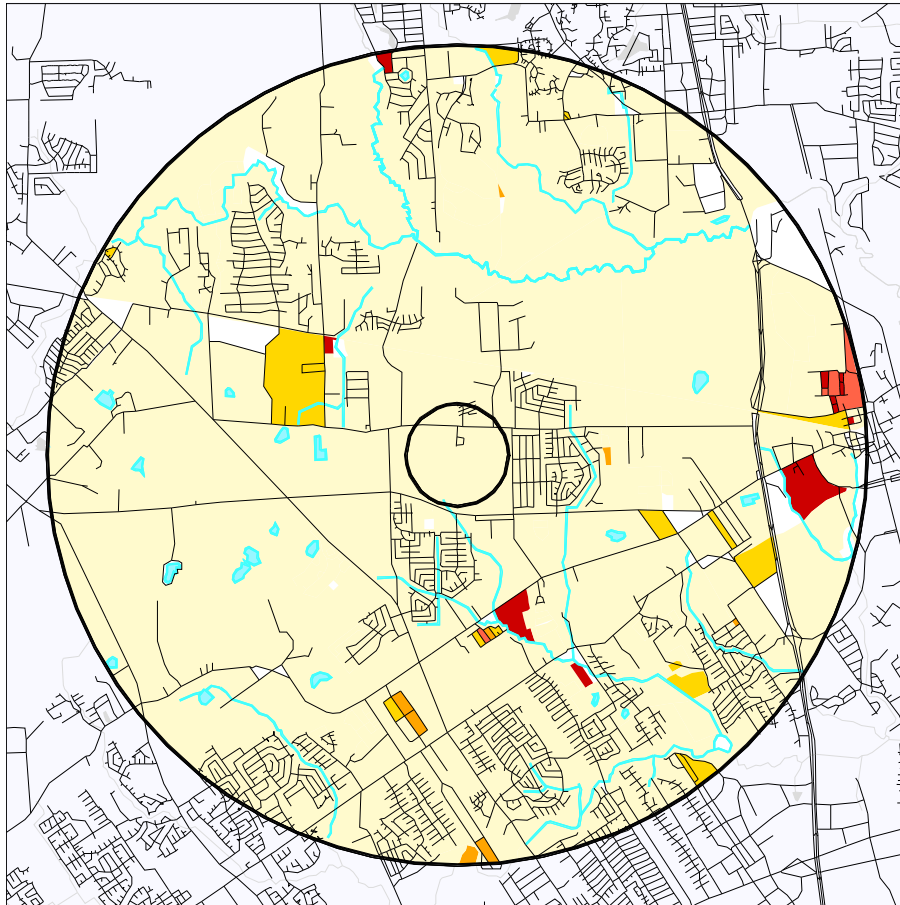
	1 Sq. Mile	50 Sq. Mile
Total Population	340	43253
Population Ranking (PF)	2	2
Percent Minority	21.5%	18.4%
Minority Status (DVMAV)	1	1
Percent Economically Stressed	8.7%	7.6%
Economic Status (DVECO)	1	1
Environmental Justice Index	2	2

Data Sources and References: US Bureau of the Census, 2000 PL94-171, SF3 Data, and TIGER Files
US EPA Region 6, 1992. Computer Assisted Environmental Assessment Methodologies, Chapter V. Special Applications,
Environmental Equity. Planning and Analysis Section, Management Division, Region 6 EPA, Dallas, Texas

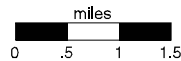


Grand Parkway Segment F2B, HOUSTON, TX

Minority Status - Degree of Vulnerability (DVMAV)

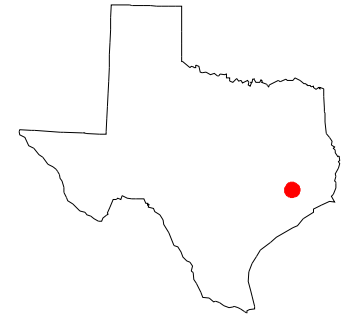


Longitude: -95 29 7.010 Latitude: 30 4 45.1



Percent Minority by Census Block
State Percentage = 47.6

- ≤ the State Percentage
- > the State Percentage,
≤ 1.33 times the State Percentage
- > 1.33 times the State Percentage,
≤ 1.66 times the State Percentage
- > 1.66 times the State Percentage,
≤ 2 times the State Percentage
- > 2 times the State Percentage



Potential Environmental
Justice Index for
Two Study Areas

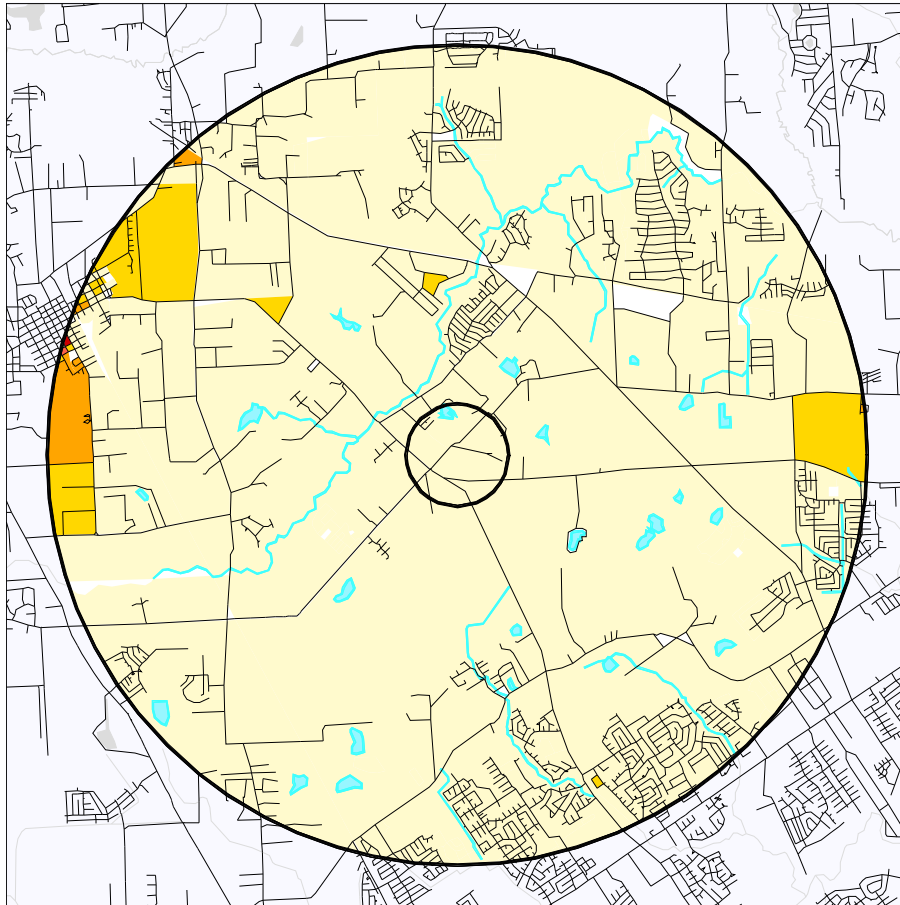
	1 Sq. Mile	50 Sq. Mile
Total Population	257	62241
Population Ranking (PF)	2	3
Percent Minority	14.4%	18%
Minority Status (DVMAV)	1	1
Percent Economically Stressed	17%	7.1%
Economic Status (DVECO)	1	1
Environmental Justice Index	2	3

Data Sources and References: US Bureau of the Census, 2000 PL94-171, SF3 Data, and TIGER Files
US EPA Region 6, 1992. Computer Assisted Environmental Assessment Methodologies, Chapter V. Special Applications,
Environmental Equity. Planning and Analysis Section, Management Division, Region 6 EPA, Dallas, Texas



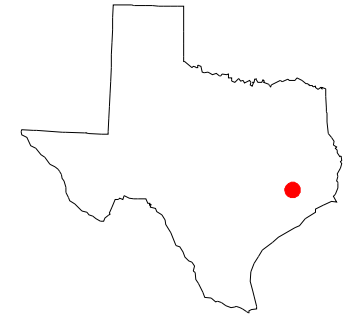
Grand Parkway Segment F2A, HOUSTON, TX

Economic Status - Degree of Vulnerability (DVECO)



Percent Economically Stressed by Census Block Group
State Percentage = 23.6

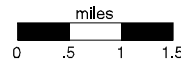
- ≤ the State Percentage
- > the State Percentage, ≤ 1.33 times the State Percentage
- > 1.33 times the State Percentage, ≤ 1.66 times the State Percentage
- > 1.66 times the State Percentage, ≤ 2 times the State Percentage
- > 2 times the State Percentage



Potential Environmental Justice Index for Two Study Areas

	1 Sq. Mile	50 Sq. Mile
Total Population	340	43253
Population Ranking (PF)	2	2
Percent Minority	21.5%	18.4%
Minority Status (DVMAV)	1	1
Percent Economically Stressed Economic Status (DVECO)	8.7%	7.6%
	1	1
Environmental Justice Index	2	2

Longitude: -95 33 5.51 Latitude: 30 4 35.1

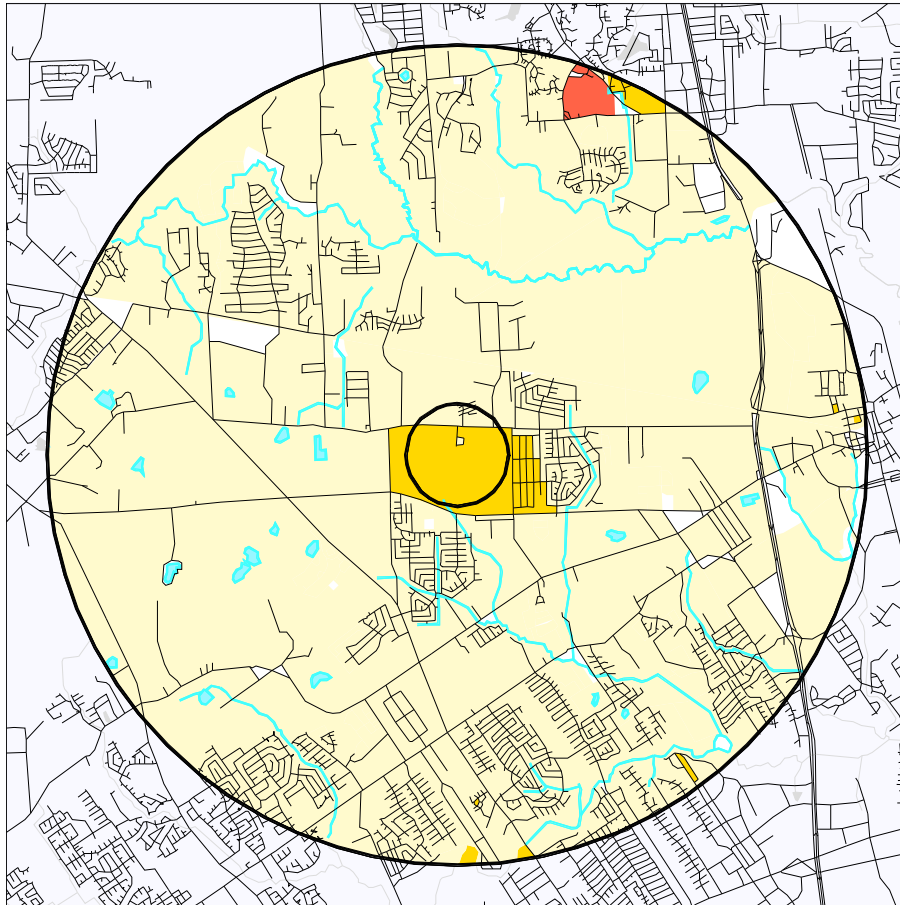


Data Sources and References: US Bureau of the Census, 2000 PL94-171, SF3 Data, and TIGER Files
US EPA Region 6, 1992. Computer Assisted Environmental Assessment Methodologies, Chapter V. Special Applications, Environmental Equity. Planning and Analysis Section, Management Division, Region 6 EPA, Dallas, Texas



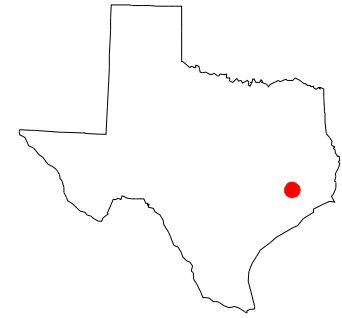
Grand Parkway Segment F2B, HOUSTON, TX

Economic Status - Degree of Vulnerability (DVECO)



Percent Economically Stressed by Census Block Group
State Percentage = 23.6

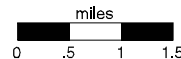
- ≤ the State Percentage
- > the State Percentage,
≤ 1.33 times the State Percentage
- > 1.33 times the State Percentage,
≤ 1.66 times the State Percentage
- > 1.66 times the State Percentage,
≤ 2 times the State Percentage
- > 2 times the State Percentage



Potential Environmental Justice Index for Two Study Areas

	1 Sq. Mile	50 Sq. Mile
Total Population	257	62241
Population Ranking (PF)	2	3
Percent Minority	14.4%	18%
Minority Status (DVMAV)	1	1
Percent Economically Stressed Economic Status (DVECO)	17%	7.1%
	1	1
Environmental Justice Index	2	3

Longitude: -95 29 7.010 Latitude: 30 4 45.1

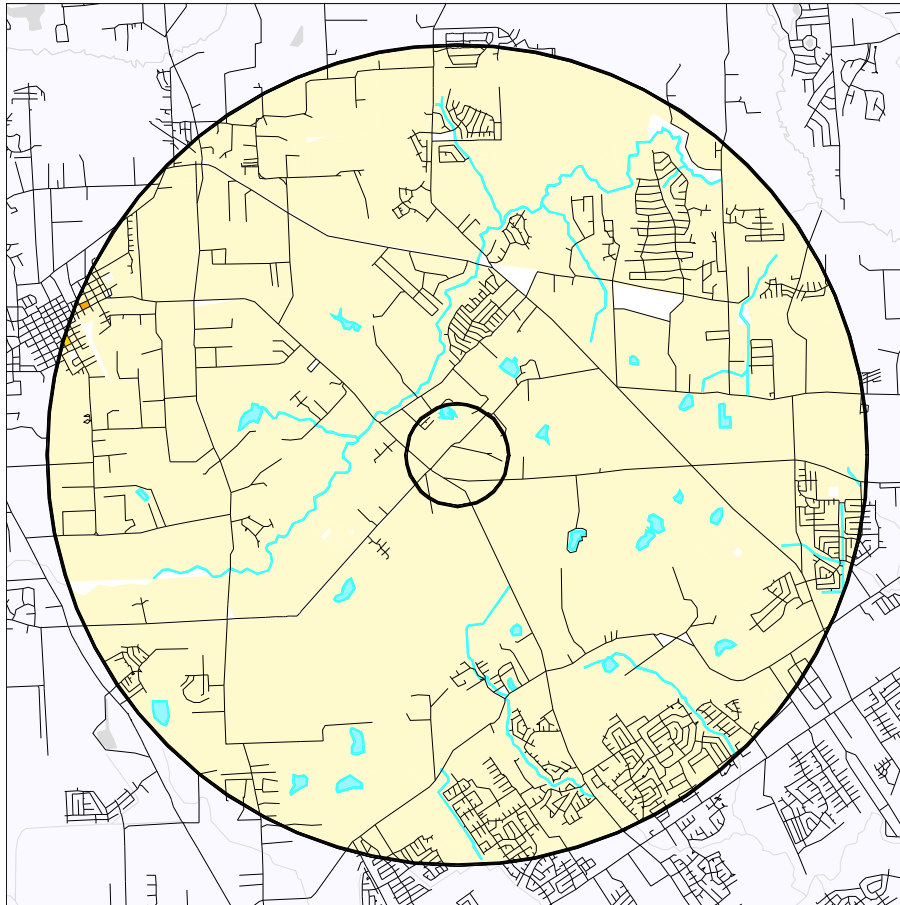


Data Sources and References: US Bureau of the Census, 2000 PL94-171, SF3 Data, and TIGER Files
US EPA Region 6, 1992. Computer Assisted Environmental Assessment Methodologies, Chapter V. Special Applications, Environmental Equity. Planning and Analysis Section, Management Division, Region 6 EPA, Dallas, Texas

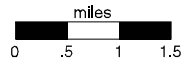


Grand Parkway Segment F2A, HOUSTON, TX

Potential Environmental Justice Index (EJ)

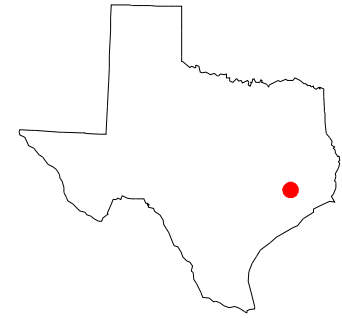


Longitude: -95 33 5.51 Latitude: 30 4 35.1



Criteria Ranked by Census Block
(DVMAV * DVECO * PF)

- 1 to 12
- 13 to 25
- 26 to 37
- 38 to 50
- 51 to 100



Potential Environmental
Justice Index for
Two Study Areas

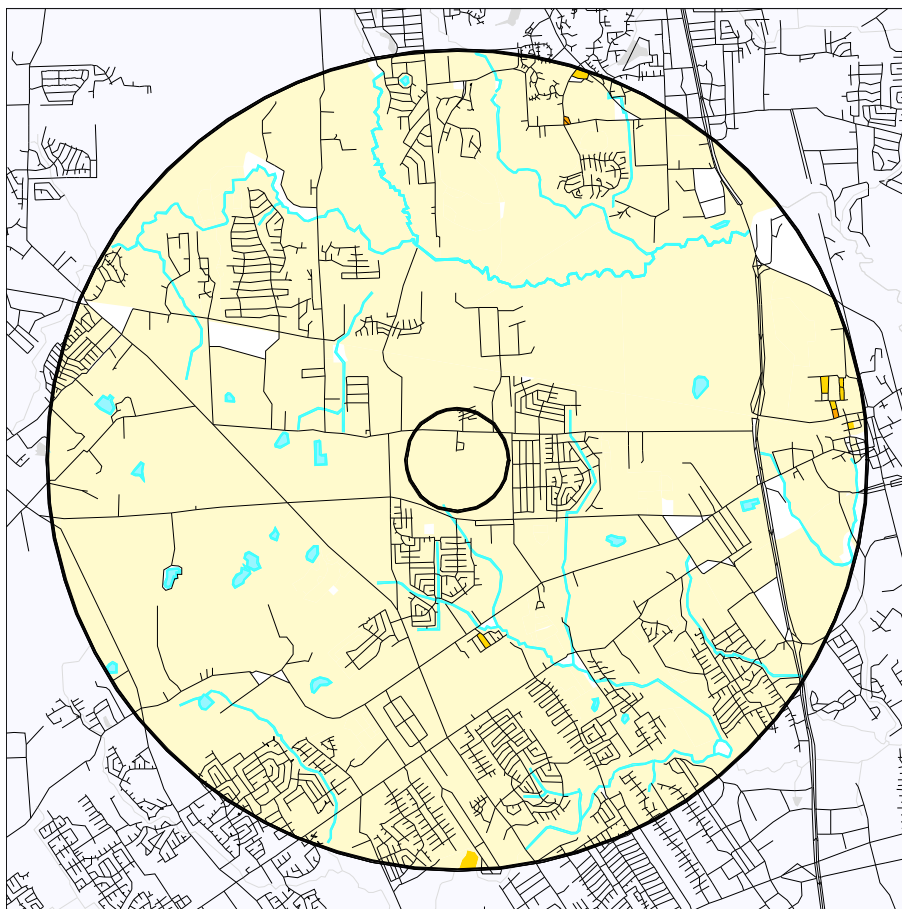
	1 Sq. Mile	50 Sq. Mile
Total Population	340	43253
Population Ranking (PF)	2	2
Percent Minority	21.5%	18.4%
Minority Status (DVMAV)	1	1
Percent Economically Stressed	8.7%	7.6%
Economic Status (DVECO)	1	1
Environmental Justice Index	2	2

Data Sources and References: US Bureau of the Census, 2000 PL94-171, SF3 Data, and TIGER Files
US EPA Region 6, 1992. Computer Assisted Environmental Assessment Methodologies, Chapter V. Special Applications,
Environmental Equity. Planning and Analysis Section, Management Division, Region 6 EPA, Dallas, Texas

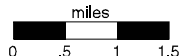


Grand Parkway Segment F2B, HOUSTON, TX

Potential Environmental Justice Index (EJ)

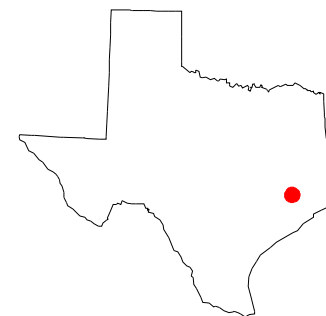


Longitude: -95 29 7.010 Latitude: 30 4 45.1



Criteria Ranked by Census Block (DVMAV * DVECO * PF)

- 1 to 12
- 13 to 25
- 26 to 37
- 38 to 50
- 51 to 100



Potential Environmental Justice Index for Two Study Areas

	1 Sq. Mile	50 Sq. Mile
Total Population	257	62241
Population Ranking (PF)	2	3
Percent Minority	14.4%	18%
Minority Status (DVMAV)	1	1
Percent Economically Stressed	17%	7.1%
Economic Status (DVECO)	1	1
Environmental Justice Index	2	3

Data Sources and References: US Bureau of the Census, 2000 PL94-171, SF3 Data, and TIGER Files
 US EPA Region 6, 1992. Computer Assisted Environmental Assessment Methodologies, Chapter V. Special Applications,
 Environmental Equity. Planning and Analysis Section, Management Division, Region 6 EPA, Dallas, Texas

