

**Underground Injection Control  
Carbon Sequestration  
Class VI Permit Application**

**ENVIRONMENTAL JUSTICE  
40 CFR 146.85  
Section 13.0**

**NexGen Carbon Oklahoma, LLC  
Vanguard CCS Hub**

**June 2025**

## 13.0 ENVIRONMENTAL JUSTICE

### Vanguard CCS Hub

#### Facility Information

Facility name: Vanguard CCS Hub

Vanguard I-1  
Vanguard I-2  
Vanguard I-3  
Vanguard I-4  
Vanguard I-5  
Vanguard I-6  
Vanguard I-8  
Vanguard I-9  
Vanguard I-10  
Vanguard I-12

Facility contact: Marc Thomas, President & COO  
600 Rockmead Drive, Suite 112  
Kingwood, TX 77339  
(346) 576-8215  
[marcthomas@nexgencarbonsolutions.com](mailto:marcthomas@nexgencarbonsolutions.com)

Well locations: Osage County, Oklahoma

Vanguard I-1: Lat 36.633288°N, Lon -96.571029°W (NAD 83)  
Vanguard I-2: Lat 36.660083°N, Lon -96.534652°W (NAD 83)  
Vanguard I-3: Lat 36.664329°N, Lon -96.586951°W (NAD 83)  
Vanguard I-4: Lat 36.710244°N, Lon -96.542370°W (NAD 83)  
Vanguard I-5: Lat 36.744047°N, Lon -96.533843°W (NAD 83)  
Vanguard I-6: Lat 36.724157°N, Lon -96.489526°W (NAD 83)  
Vanguard I-8: Lat 36.823356°N, Lon -96.620496°W (NAD 83)  
Vanguard I-9: Lat 36.849167°N, Lon -96.592912°W (NAD 83)  
Vanguard I-10: Lat 36.893849°N, Lon -96.578026°W (NAD 83)  
Vanguard I-12: Lat 36.785641°N, Lon -96.594085°W (NAD 83)

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## Acronyms and Abbreviations

### A

ACS	U.S. Census Bureau's American Community Survey
AoR	Area of Review
API	American Petroleum Institute

### C

CEQ	Council on Environmental Quality
CO <sub>2</sub>	Carbon Dioxide

### E

EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency

### I

ISA	Impact Study Area
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### N

### U

USDW	Underground Source of Drinking Water
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## 13.1 Environmental Justice

### 13.1.1 Introduction

Environmental justice (EJ) aims to ensure equitable treatment and active involvement of all individuals, regardless of race, ethnicity, national origin, or income, in the formulation, implementation, and enforcement of environmental policies and laws (USEPA 1998). This principle was formally addressed by Executive Order 12898, issued on February 11, 1994, requiring the identification and evaluation of programs, policies, and activities that may disproportionately impact minority and low-income populations in the United States.

The Council on Environmental Quality (CEQ) defines minorities as individuals identifying as American Indian or Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), or Hispanic. Minority populations are classified under the following criteria:

- When the minority population within the affected area exceeds 50%, or
- When the minority population within the affected area is significantly greater (at least 10% higher) than the minority population percentage in the general population or another appropriate geographic unit.

CEQ guidance also recommends identifying low-income populations within the affected area using data from the U.S. Census Bureau on income and poverty levels. For this Environmental Justice assessment, block group-level data from the Census Bureau's American Community Survey (ACS) were analyzed to evaluate minority and low-income populations in accordance with these criteria.

The EJ assessment for the proposed project evaluates whether any potentially significant and adverse impacts on human health or the environment exist and examines whether such impacts would disproportionately affect defined communities and populations. If identified, methodologies for mitigating or minimizing these effects are outlined.

This assessment followed the methodologies detailed in Promising Practices for EJ Methodologies in NEPA Reviews and included the following steps:

1. Defining the Area of Analysis: The geographic boundaries of the affected area were established.
2. Identifying Vulnerable Populations: The distribution of minority and low-income populations within the defined area was analyzed.
3. Evaluating Project Impacts: Potential adverse effects on human health or the environment due to project activities were assessed.
4. Determining Disproportionate Impacts: Identified adverse impacts were evaluated to determine if they would disproportionately affect minority or low-income communities.
5. Mitigation and Minimization: Where applicable, strategies to reduce or mitigate adverse impacts on affected populations were outlined.

The Environmental Justice mapping and screening tool, EJScreen, was utilized to gather consistent, national-level data and combine environmental, demographic, and socioeconomic

indicators.<sup>1</sup> This tool provided critical data inputs for the analysis and conclusions within this EJ report.

This assessment provides a framework for identifying and addressing potential environmental justice concerns associated with the project. It ensures compliance with regulatory requirements and integrates strategies to minimize adverse impacts on vulnerable communities while maintaining transparency in environmental stewardship.

### ***13.1.2 Area Overview***

The Vanguard CCS Hub is located in Osage County, Oklahoma. The population of Osage County is approximately 46,130, with the specific Impact Study Area (ISA) for this assessment encompassing a population of roughly 194 individuals.

For the EJ assessment, a one-mile radius around the AoR was established to define the ISA and encompasses the entirety of preliminary AoR. This defined area provides the basis for evaluating potential environmental and demographic impacts. A map showing the project site and the corresponding ISA buffer is included in **Figure 13.1**.

This geographic and demographic overview establishes the framework for assessing Environmental Justice considerations, ensuring that potential impacts on local populations, including minority and low-income groups, are evaluated comprehensively and in alignment with applicable federal guidelines.

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<sup>1</sup> U.S. Environmental Protection Agency. 2025. EJScreen Tool. Retrieved January 2025, from URL <https://www.epa.gov/ejscreen>.

# Claimed as PBI



Figure 13.1 - Impact Study Area Map (1 Mile Buffer Around AoR)

### ***13.1.3 EJScreen Results***

#### ***13.1.3.1 EJ Screen Census Summary and American Community Survey Report(s)***

The EJScreen (2018–2022) Summary Report identified that within a 1-mile radius the Vanguard CCS Hub AoR in Osage County, Oklahoma, the total population was 194. Of this number, 52 individuals (27%) identified as persons of color. Census data further indicated that 75% of the population was over the age of 18, with 74% of households owner-occupied and 26% renter occupied. Detailed census data can be reviewed in (**Table 13.1** to **Table 13.3**). The ACS Report specified that the area the ISA consisted of [REDACTED] square miles of land (98%) and [REDACTED] square miles of water, representing 2% of the total area.

The ACS data revealed that 92% of the population had an educational background of high school graduate or higher. Only 6% of individuals completed education through grades 9–12 (no diploma), and 2% had an education level below this. Language proficiency within the ISA showed that 100% of the population spoke English, with 95% speaking only English, 2% speaking English "very well", 2% speaking English "well", and 1% speaking English "not well". Household income data indicated that 48% of households earned \$50,000 or more annually. Additional details and supporting figures are provided in (**Table 13.1** to **Table 13.3**).

#### ***13.1.3.2 EJScreen Community Report***

The EJScreen Community Report assessed Thirteen EJ Indexes, combining environmental and socioeconomic data to compare the conditions within the ISA in Osage County, Oklahoma, to both state (Oklahoma) and national percentiles. These Environmental Indexes include:

- Particulate Matter 2.5
- Ozone
- Nitrogen Dioxide
- Diesel Particulate Matter
- Toxic Releases to Air
- Traffic Proximity
- Lead Paint
- Superfund Proximity
- RMP Facility Proximity
- Hazardous Waste Proximity
- Underground Storage Tanks (UST) Proximity
- Wastewater Discharge
- Drinking Water Non-Compliance

The evaluation indicated that residents within ISA faced a minor increased exposure risks for Particulate Matter 2.5, Lead Paint (% Pre-1960 Housing), and Drinking Water Non-Compliance (Points). The remaining indexes were below state and national percentiles.

Further details can be reviewed in the EJScreen Community Report, provided in (**Figure 13.2** to **Figure 13.5**).



#### ***13.1.4 Interpretation of Results***

The analysis of pollution risk sources from the EJScreen Report highlights that the development and operation of the proposed NexGen injection wells in Osage County, Oklahoma, will provide tangible environmental benefits. By sequestering carbon dioxide that would otherwise be emitted, the project has the potential to positively impact key EJ Index results, including:

- Particulate Matter 2.5
- Ozone
- Diesel Particulate Matter
- Air Toxics Cancer Risk
- Air Toxics Respiratory HI

The remaining EJ Indexes are not expected to be affected, as Class VI well operations do not contribute to risks such as lead paint, hazardous waste proximity, or wastewater discharge. Thus, the project's focus on carbon sequestration aligns with efforts to mitigate air quality-related risks for the surrounding population.

Table 13.1 - American Community survey Report(s) (2018-2022), Page 1



		<b>EJScreen ACS Summary Report</b>		
Location: 0.1 miles Ring around the Area				
Description: NEXGEN_CO2_V6-18MMCF-20Y-13W				
<b>Summary of ACS Estimates</b>		2018 - 2022		
Population		194		
Population Density (per sq. mile)		1		
People of Color Population		52		
% People of Color Population		27%		
Households		75		
Housing Units		92		
Housing Units Built Before 1950		21		
Per Capita Income		25,419		
Land Area (sq. miles) (Source: SF1)		234.28		
% Land Area		98%		
Water Area (sq. miles) (Source: SF1)		3.84		
% Water Area		2%		
		2018 - 2022 ACS Estimates	Percent	MOE (±)
<b>Population by Race</b>				
Total		194	100%	323
Population Reporting One Race		170	88%	553
White		142	73%	286
Black		1	1%	81
American Indian		25	13%	92
Asian		1	0%	24
Pacific Islander		0	0%	10
Some Other Race		1	0%	60
Population Reporting Two or More Races		24	12%	105
Total Hispanic Population		2	1%	57
Total Non-Hispanic Population		192		
White Alone		142	73%	286
Black Alone		1	1%	79
American Indian Alone		24	13%	92
Non-Hispanic Asian Alone		1	0%	24
Pacific Islander Alone		0	0%	10
Other Race Alone		0	0%	50
Two or More Races Alone		24	12%	105
<b>Population by Sex</b>				
Male		93	48%	155
Females		101	52%	216
<b>Population by Age</b>				
Age 0-4		9	5%	55
Age 0-17		48	25%	97
Age 18+		146	75%	236
Age 65+		48	25%	116

Table 13.2 - American Community survey Report(s) (2018-2022), Page 2





			
<b>EJScreen ACS Summary Report</b>			
Location: 0.1 miles Ring around the Area Description: NEXGEN_CO2_V6-18MMCF-20Y-13W			
	2018 - 2022 ACS Estimates	Percent	MOE (±)
<b>Population 25+ by Educational Attainment</b>			
Total	138	100%	269
Less than 9th Grade	3	2%	42
9th - 12th Grade, No Diploma	9	6%	108
High School Graduate	51	37%	176
Some College, No Degree	33	24%	132
Associate Degree	15	11%	59
Bachelor's Degree or more	27	20%	81
<b>Population Age 5+ by Ability to Speak English</b>			
Total	185	100%	323
Speak only English	175	95%	291
Non-English at Home <sup>1+2+3+4</sup>	10	5%	71
<sup>1</sup> Speak English "very well"	4	2%	50
<sup>2</sup> Speak English "well"	4	2%	53
<sup>3</sup> Speak English "not well"	1	1%	39
<sup>4</sup> Speak English "not at all"	0	0%	35
<sup>3+4</sup> Speak English "less than well"	1	1%	52
<sup>2+3+4</sup> Speak English "less than very well"	5	3%	74
<b>Limited English Speaking Households*</b>			
Total	0	0%	20
Speak Spanish	0	0%	10
Speak Other Indo-European Languages	0	0%	10
Speak Asian-Pacific Island Languages	0	0%	10
Speak Other Languages	0	0%	10
<b>Households by Household Income</b>			
Household Income Base	75	100%	141
< \$15,000	12	16%	68
\$15,000 - \$25,000	7	9%	46
\$25,000 - \$50,000	20	27%	127
\$50,000 - \$75,000	16	21%	98
\$75,000	20	27%	59
<b>Occupied Housing Units by Tenure</b>			
Total	75	100%	141
Owner Occupied	55	74%	136
Renter Occupied	20	26%	66
<b>Employed Population Age 16+ Years</b>			
Total	153	100%	272
In Labor Force	80	52%	207
Civilian Unemployed in Labor Force	4	6%	32
Not In Labor Force	73	48%	153
<small> Data Note: Detail may not sum to totals due to rounding. Hispanic population can be any race.  N/A means not available. Source: U.S. Census Bureau, American Community Survey (ACS) 2018 - 2022.  *Households in which no one 14 and over speaks English "very well" or speaks English only. </small>			
01/20/2025		2/3	

Table 13.3 - American Community survey Report(s) (2018-2022), Page 3



United States  
Environmental Protection  
Agency

# EJScreen ACS Summary Report



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Location: 0.1 miles Ring around the Area

Description: NEXGEN\_CO2\_V6-18MMCF-20Y-13W

	2018 - 2022 ACS Estimates	Percent	MOE (±)
<b>Population by Languages Spoken at Home*</b>			
Total (persons age 5 and above)	1,341	100%	175
English	1,301	97%	168
Spanish	26	2%	26
French, Haitian, or Cajun	0	0%	10
German, or other Western Germanic	2	0%	3
Russian, Polish, or Other Slavic	0	0%	10
Other Indo-European	0	0%	10
Korean	0	0%	10
Chinese (including Mandarin, Cantonese)	0	0%	10
Vietnamese	0	0%	10
Tagalog (including Filipino)	0	0%	10
Other Asian and Pacific Island	4	0%	5
Arabic	0	0%	10
Other and Unspecified	8	1%	9
Total Non-English	40	3%	243

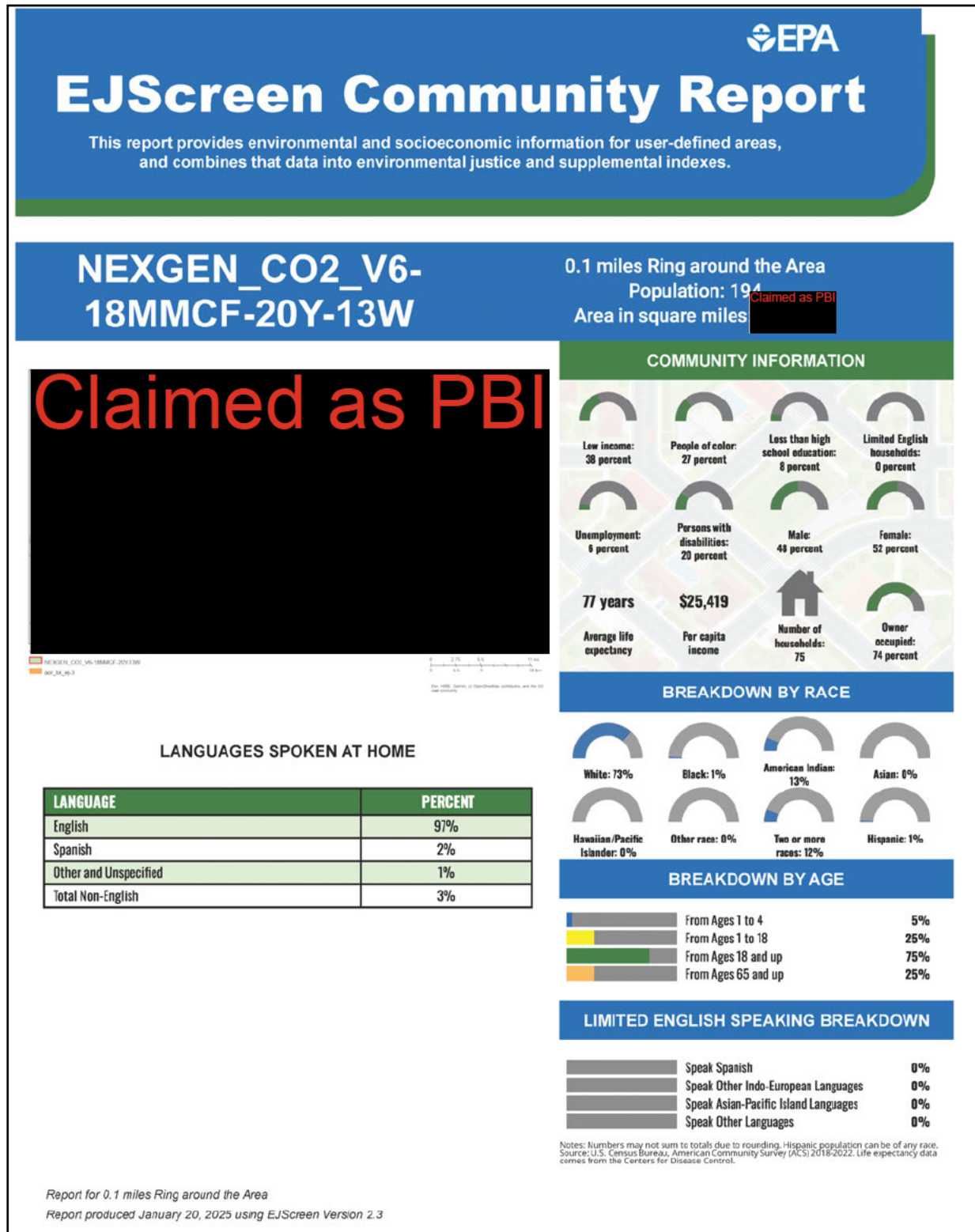


Figure 13.2 - EJScreen Community Report, Page 1

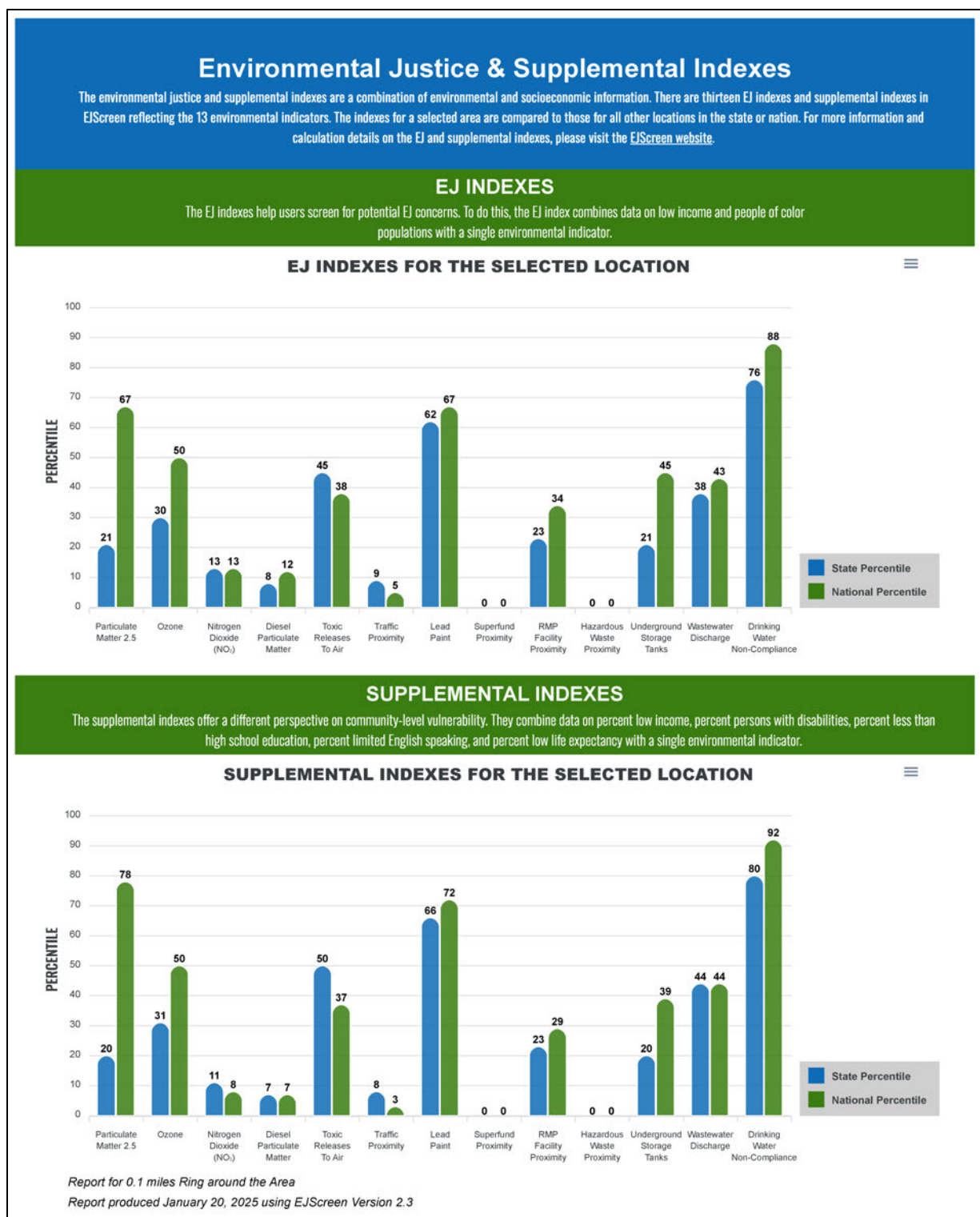


Figure 13.3 - EJScreen Community Report, Page 2



## EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
<b>ENVIRONMENTAL BURDEN INDICATORS</b>					
Particulate Matter 2.5 ( $\mu\text{g}/\text{m}^3$ )	8.57	9.1	18	8.45	63
Ozone (ppb)	57.4	59.2	24	61.8	34
Nitrogen Dioxide ( $\text{NO}_2$ ) (ppbv)	2.9	7.2	8	7.8	6
Diesel Particulate Matter ( $\mu\text{g}/\text{m}^3$ )	0.0453	0.129	6	0.191	6
Toxic Releases to Air (toxicity-weighted concentration)	180	4,100	56	4,600	31
Traffic Proximity (daily traffic count/distance to road)	3,700	620,000	7	1,700,000	2
Lead Paint (% Pre-1960 Housing)	0.32	0.24	69	0.3	60
Superfund Proximity (site count/km distance)	0	0.16	0	0.39	0
RMP Facility Proximity (facility count/km distance)	0.028	0.57	21	0.57	28
Hazardous Waste Proximity (facility count/km distance)	0	0.82	0	3.5	0
Underground Storage Tanks (count/ $\text{km}^2$ )	0.021	1.7	17	3.6	28
Wastewater Discharge (toxicity-weighted concentration/m distance)	40	380	63	700,000	48
Drinking Water Non-Compliance (points)	47	13	92	2.2	99
<b>SOCIOECONOMIC INDICATORS</b>					
Demographic Index USA	1.32	N/A	N/A	1.34	57
Supplemental Demographic Index USA	1.97	N/A	N/A	1.64	72
Demographic Index State	1.61	1.8	44	N/A	N/A
Supplemental Demographic Index State	1.55	1.53	54	N/A	N/A
People of Color	27%	36%	37	40%	45
Low Income	38%	37%	53	30%	68
Unemployment Rate	6%	5%	65	6%	64
Limited English Speaking Households	0%	2%	0	5%	0
Less Than High School Education	8%	12%	43	11%	52
Under Age 5	5%	6%	40	5%	49
Over Age 64	25%	16%	84	18%	79

\*Diesel particulate matter index is from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the Air Toxics Data Update can be found at: <https://www.epa.gov/raqs/air-toxics-data-update>.

### Sites reporting to EPA within defined area:

Superfund .....	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities .....	0
Water Dischargers .....	4
Air Pollution .....	14
Brownfields .....	0
Toxic Release Inventory .....	0

### Other community features within defined area:

Schools .....	0
Hospitals .....	0
Places of Worship .....	0

### Other environmental data:

Air Non-attainment .....	No
Impaired Waters .....	Yes

Selected location contains American Indian Reservation Lands* .....	Yes
Selected location contains a "Justice40 (CEJST)" disadvantaged community .....	Yes
Selected location contains an EPA IRA disadvantaged community .....	Yes

Report for 0.1 miles Ring around the Area

Report produced January 20, 2025 using EJScreen Version 2.3

Figure 13.4 - EJScreen Community Report, Page 3

EJScreen Environmental and Socioeconomic Indicators Data					
HEALTH INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	23%	22%	59	20%	81
Heart Disease	9	6.7	89	5.8	94
Asthma	12	11.5	71	10.3	89
Cancer	8.1	6.7	86	6.4	84
Persons with Disabilities	20.4%	17.3%	70	13.7%	86
CLIMATE INDICATORS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	12%	8%	80	12%	72
Wildfire Risk	85%	43%	67	14%	89
CRITICAL SERVICE GAPS					
INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	18%	15%	65	13%	75
Lack of Health Insurance	18%	15%	72	9%	90
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access Burden	Yes	N/A	N/A	N/A	N/A
Food Desert	Yes	N/A	N/A	N/A	N/A

Figure 13.5 - EJScreen Community Report, Page 4

### 13.1.5 Environmental Justice Memo Responses

In accordance with the EPA Memorandum on EJ Guidance for UIC Class VI Permitting and Primacy, dated August 17, 2023, NexGen has prepared responses addressing the key elements outlined in the guidance. These responses demonstrate NexGen's commitment to aligning project activities with environmental justice principles and ensuring equitable treatment and meaningful involvement of affected communities.

#### 13.1.5.1 Sensitive receptors in the Impact Study Area

The EPA identifies sensitive receptors as locations where occupants are more vulnerable to the harmful effects of exposure to pollutants such as toxic chemicals and pesticides. Examples include hospitals, schools, daycare centers, elderly housing, and convalescent facilities.

An analysis of the ISA for the Vanguard CCS Hub and associated injection wells in Osage County, Oklahoma, indicates that there are three schools within a 4-mile radius of the project sites.

#### 13.1.5.2 Identify Communities with Potential EJ Concerns

The EJScreen analysis indicates that the ISA is sparsely populated, with the local demographic predominantly White. NexGen's approach to identifying and mitigating environmental and social risks will help ensure that communities potentially affected by human health,



environmental, climate-related, or cumulative harms are proactively identified. This process aligns with NexGen's commitment to meaningful community engagement, fostering fair treatment and inclusive participation in the UIC permitting process.

#### *13.1.5.3 Enhance Public Involvement*

NexGen is dedicated to fostering inclusive public participation throughout the project's lifecycle. Engagement efforts began in 2024 and will continue as the project progresses, including collaboration with local leaders, residents, landowners, mineral rights holders, community organizations, and state and local government agencies. NexGen will also involve offset oil and gas operators and industry organizations in these discussions to ensure comprehensive stakeholder involvement.

#### *13.1.5.4 Enhance Transparency Throughout the Permitting Process*

NexGen is committed to a transparent permitting process in collaboration with the EPA and Oklahoma regulatory agencies. NexGen will provide compliance reports, monitoring test results, and records required by the permit in a publicly accessible format, available on the corporate website.

During the monitoring and post-injection site care period, reports submitted to the EPA will also be shared publicly. Additionally, NexGen will include updates on monitoring results in its annual sustainability report to maintain transparency and foster community trust. These efforts are intended to demonstrate that permanent CO<sub>2</sub> sequestration is safe, effective, and protective of USDWs, the environment, and human health.

#### *13.1.5.5 Minimize Adverse Effects to USDWs and Communities*

NexGen will work closely with the EPA, local regulators, and community stakeholders, including emergency response teams, healthcare facilities, and emergency management organizations, to prevent adverse impacts to USDWs and the surrounding community. This proactive collaboration will ensure all project activities comply with regulatory standards and prioritize the safety and well-being of the communities NexGen serves throughout the project's duration.

### ***13.1.6 Summary of Environmental Justice Analysis***

NexGen compiled this Environmental Justice (EJ) analysis using data from the EPA's EJScreen tool, Census Bureau, and other reliable sources.

The EJScreen and Census Bureau data, as robust and consistent tools, do not indicate any significant EJ-related concerns given the small population within the ISA.

The interpretation of results suggests that the development and operation of the Class VI injection well will positively impact the local population by sequestering carbon dioxide, reducing emissions, and enhancing air quality. NexGen recognizes the importance of additional measures to ensure the community is not negatively impacted.

Moreover, the project offers potential socio-economic benefits to the surrounding area, including job creation, apprenticeship opportunities during construction, support for local businesses, and improved infrastructure and workforce skills.

NexGen remains dedicated to fostering open communication with the local community. The development of a Monitoring, Reporting, and Verification (MRV) Plan, in compliance with Subpart RR under the Greenhouse Gas Reporting Program (40 CFR Part 98), will further reinforce safety, ensure accountability, and provide continuous oversight of project activities.

### ***13.1.7 References***

- U.S. Environmental Protection Agency. 1998. Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. April 1998.
- U.S. Census Bureau. (2022). 2018-2022 American Community Survey 5-Year Estimates. Retrieved December 2024, from URL <https://data.census.gov>.