



TO: ELG Planning Record - EPA-HQ-OW-2021-0547

FROM: U.S. EPA

DATE: November 9, 2022

SUBJECT: 2021 Annual Review Environmental Justice Evaluation Methodology – DCN 11188

## 1. Introduction and Background

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Executive Order 12898 directs federal agencies to identify and address disproportionate human health or environmental impacts on people of color and low-income populations in its actions (U.S. EPA, 2022a). To that end, EPA is incorporating a screening-level environmental justice analysis into its 2021 annual review of effluent limitations guidelines and standards (ELGs). The purpose of this analysis is to determine whether facilities within specific point source categories are located in areas with higher percentages of demographics, including people of color and low income populations, compared to the national average. EPA notes that this analysis is not intended to identify whether the wastewater discharges from facilities have a disproportionate impact on associated communities with environmental justice concerns, rather it serves to provide an initial assessment of whether the point source category as a whole, by proximity of facilities to certain demographics, generally poses potential environmental justice concerns.

This memorandum details EPA's methodology for evaluating potential environmental justice concerns associated with facilities in three industrial point source categories for which EPA conducted more in-depth reviews as part of its 2021 annual review of ELGs, including Leather Tanning and Finishing (40 CFR Part 425), Paint Formulating (40 CFR Part 446), and Plastics Molding and Forming (40 CFR Part 463). EPA's *2021 Preliminary Review of Industrial Point Source Categories* presents the category-specific environmental justice analyses and findings (U.S. EPA, 2022b).

## 2. Data Source Overview

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EPA evaluated existing socioeconomic, health, and location data to support the annual review process and summarize potential environmental justice concerns for the three point source categories: Leather Tanning and Finishing, Paint Formulating, and Plastics Molding and Forming. For each of the three preliminary category reviews, EPA used the data sources shown in Table 1.

**Table 1. Data Sources and Limitations for 2021 ELG Annual Review Environmental Justice Evaluation**

| Data Source  | Data Used in This Analysis   | Purpose   | Limitations   | Reference         |
|--|--|---|---|-------------------|
| Facility Registry Service (FRS) National Combined File | <ul style="list-style-type: none"> <li>Facility FRS IDs</li> <li>Coordinates (latitude/longitude) of each associated facility</li> </ul>   | This data source was used to link each facility location to its census block group with corresponding demographics.   | N/A   | (U.S. EPA, 2022c) |
| Water Pollutant Loading Tool Download                  | <ul style="list-style-type: none"> <li>List of facilities with 2020 Discharge Monitoring Report (DMR) loadings</li> <li>Associated facility coordinates</li> <li>Associated facility National Pollutant Discharge Elimination System (NPDES) and FRS ID</li> </ul> | <p>This data source was used to identify the 2021 annual review population.</p> <p>Facility coordinates were used to supplement the FRS national combined file, where location data were not available.</p> | Integrated Compliance Information System (ICIS)-NPDES, the underlying data source for DMR data in the Water Pollutant Loading Tool, only contains data for facilities that have a NPDES permit and are directly discharging to surface waters. See the <i>2021 Preliminary Review of Industrial Point Source Categories</i> for additional limitations of the DMR data set. | (U.S. EPA, 2022d) |
| Toxics Release Inventory (TRI) Basic Data File         | <ul style="list-style-type: none"> <li>List of facilities with 2020 TRI direct and/or indirect releases</li> <li>Associated facility coordinates</li> <li>Associated facility North American Industrial Classification System (NAICS) code.</li> </ul>             | This data source was used to identify additional facilities in the population for the 2021 annual review, including indirect dischargers as well as direct dischargers not otherwise identified             | Due to reporting thresholds, facilities reporting to TRI may be a subset of the point source category; this analysis may not capture all facilities with releases. See the <i>2021 Preliminary Review of Industrial Point Source Categories</i> for additional limitations of the TRI data set.   | (U.S. EPA, 2022e) |

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| Data Source                                   | Data Used in This Analysis  | Purpose   | Limitations   | Reference                |
|---|---|---|---|--------------------------|
|   | <ul style="list-style-type: none"> <li>Associated facility TRI and FRS ID</li> </ul>  | <p>from the Water Pollutant Loading Tool download.</p> <p>Facility coordinates were used to supplement the FRS national combined file where location data were not available.</p>   |   |                          |
| <b>Water Pollutant Loading Tool Resources</b> | <ul style="list-style-type: none"> <li>NPDES ID to point source category crosswalk</li> <li>NAICS code to point source category crosswalk.</li> </ul> | <p>This data source is used to map facilities identified from the Water Pollutant Loading Tool Download and the TRI Basic Data File to the most relevant point source category.</p> | <p>DMR and TRI facilities are identified by industrial classification codes (Standard Industrial Classification (SIC) and NAICS); however, most point source categories are not defined by industrial classification codes. The crosswalks, therefore, may not link all facilities regulated under the appropriate PSC or oversimplify the industrial classification of facility discharges. See the <i>2021 Preliminary Review of Industrial Point Source Categories</i> for additional details on limitations for these crosswalks.</p> | (U.S. EPA, 2022f; 2022g) |
| <b>EJScreen</b>                               | <p>Demographic metrics and indicators (as percentiles, relative to the national average) by census block group:</p>                                   | <p>This data source is used to determine the census block group demographics</p>  | <p>EJScreen demographic data is derived from survey data rather than a full census of households; thus, all inaccuracies derive from sampling error. In addition, census block groups cover a small population (usually 600</p>   | (U.S. EPA, 2022h)        |

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| Data Source  | Data Used in This Analysis   | Purpose  | Limitations  | Reference   |
|--|--|--|--|-------------|
|  | <ul style="list-style-type: none"> <li>Two-metric (average of people of color and low income indicators)</li> <li>Low income, education, linguistic isolation, unemployment, and life expectancy indicators</li> </ul> | based on a facility's coordinates.   | to 3,000 people), so the demographic metrics have uncertain estimates. In addition, the census block group corresponds with the facility's location, which may not always represent the facility's wastewater discharge/release location (e.g., a facility transfers wastewater to a treatment plant in another census block). Refer to the <i>EJScreen Technical Documentation</i> for additional limitations (U.S. EPA, 2019). |             |
| <b>Federal Communications Commission (FCC) Geocoding Application Programming Interface (API)</b> | Programming language to translate facility coordinates to a census block group.  | This data source is used to derive DMR and TRI facility census block groups using their coordinates. | N/A  | (FCC, 2022) |

EPA preferentially used facility coordinates from the FRS national combined file to identify and map the facility location, as the FRS coordinates are more likely to be accurate and up to date; where data were unavailable, EPA used the coordinates available in the Water Pollutant Loading Tool download or TRI Basic Data File. EPA imported information from all data sources to a QlikSense application to summarize and visualize the data, as described in Section 3.

## 3. Data Processing

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### 3.1 Data Preparation

In the QlikSense application, EPA first generated a list of facilities to include in the analysis, consistent with the 2021 annual review data set. Specifically, for facilities with 2020 DMR loadings, EPA crosslinked the NPDES IDs from the Water Pollutant Loading Tool Download to the NPDES ID/point source category crosswalk, as described in EPA's *2021 Annual Review of Industrial Wastewater Discharges* (U.S. EPA, 2022i). Similarly, for facilities with 2020 TRI releases, EPA used the reported NAICS code for TRI facilities to crosslink with the NAICS/point source category crosswalk. Where a facility had both DMR loadings and TRI releases, EPA considered this facility as one record in the universe of facilities to evaluate for environmental justice concerns.

Next, EPA associated each facility to a census block group using the FRS ID and coordinates from the national combined file and the FCC API. For each census block group, EPA identified the corresponding two- and five-metrics to assess environmental justice concerns. Each metric is presented in terms of a percentile. Percentiles indicate what percentage of the U.S. population has a lower or higher value (e.g., for a census block group with a low-income index in the 40<sup>th</sup> percentile, 60 percent of census block groups in the U.S. have a higher percentage of people with low income and 40 percent have a lower percentage). The standard two-metric percentile (also known as the "demographic index" in EJScreen), which includes the people of color and low-income indicators, is calculated as the average of the two demographic indicator percentiles for each census block group in EJScreen, as shown in the following equation (U.S. EPA, 2019):

$$\text{Two-Metric: Average}(\text{People of Color} + \text{Low Income})$$

EPA also extracted individual indicators from EJScreen, including low income, education, linguistic isolation, unemployment, and life expectancy for the corresponding census block groups. EPA then averaged these indicators together to determine the five-metric. For some census block groups, life expectancy is not available, so the remaining four metrics were averaged together for the resulting index using the following equation:

$$\text{Five-Metric: Average}(\text{Low Income} + \text{Education} + \text{Linguistic Isolation} + \text{Unemployment} + \text{Life Expectancy} \\ (\text{where available}))$$

### 3.2 Data Visualization/Processing

To map the universe of facilities with DMR loadings and/or TRI releases, EPA used the facility coordinates, represented on a map of the U.S. with a circular icon.

EPA implemented a point source category filter in the map as well as filters for the two- and five-metrics and individual indicators. When one of the filters is selected, the circular icon for each facility has the

following color-coding, representing the relative demographics as compared to other census block groups in the U.S.:

- Dark green: metric (i.e., two-metric or five-metric) or indicator (e.g., people of color) is at the 80<sup>th</sup> percentile or higher.
- Medium green: metric or indicator is between the 50<sup>th</sup> and 80<sup>th</sup> percentiles.
- Light green: metric or indicator is below the 50<sup>th</sup> percentile.
- White: data is not available for the metric or indicator for the facility's corresponding census block group.

EPA chose to highlight facilities with metrics or indicators greater than the 50<sup>th</sup> percentile as it represents areas with demographics that are higher the national average. Similar to EJScreen, EPA also highlighted facilities in census block groups with metrics or indicators greater than the 80<sup>th</sup> percentile; while they do not signify a corresponding risk level or policy, these facilities may warrant closer attention (U.S. EPA, 2019).

After joining and processing the data sets in QlikSense, EPA downloaded an Excel file of the combined data sets. EPA further processed the data by calculating the average and median demographic metrics and indicators across all facilities for a point source category to understand the category's overall potential environmental justice concerns relative to the national average.

## 4. References

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1. FCC. 2022. Federal Communications Commission. Geocoding Application Programming Interface (API). Date accessed: August 5, 2022.
2. U.S. EPA. 2019. U.S. Environmental Protection Agency. *EJScreen Technical Documentation*. (September) [https://www.epa.gov/sites/default/files/2021-04/documents/ejscreen\\_technical\\_document.pdf](https://www.epa.gov/sites/default/files/2021-04/documents/ejscreen_technical_document.pdf).
3. U.S. EPA. 2022a. U.S. Environmental Protection Agency. *Summary of Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. (12 September) <https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice>.
4. U.S. EPA. 2022b. U.S. Environmental Protection Agency. *2021 Preliminary Review of Industrial Point Source Categories*. (November) DCN 11137.
5. U.S. EPA. 2022c. U.S. Environmental Protection Agency. Facility Registry Service (FRS) National Combined File. (05 August) DCN 11190.
6. U.S. EPA. 2022d. U.S. Environmental Protection Agency. Water Pollutant Loading Tool download of 2020 DMR data. (20 April) DCN 11191.
7. U.S. EPA. 2022e. U.S. Environmental Protection Agency. TRI Basic Data Files: Calendar Years 1987 – Present. (05 August) DCN 11192.
8. U.S. EPA. 2022f. U.S. Environmental Protection Agency. Effluent Guidelines (ELGs) Crosswalks – NAICS to Point Source Category. (05 August). DCN 11193.
9. U.S. EPA. 2022g. U.S. Environmental Protection Agency. Effluent Guidelines (ELGs) Crosswalks – SIC to Point Source Category. (05 August). DCN 11194.
10. U.S. EPA. 2022h. U.S. Environmental Protection Agency. *EJSCREEN\_2021\_USPR*. (22 February) <https://gaftp.epa.gov/EJSCREEN/2021/>. DCN 11195.

11. U.S. EPA. 2022i. U.S. Environmental Protection Agency. *2021 Annual Review of Industrial Wastewater Discharges*. (November) DCN 11139.