



Near-Source and Fugitive Monitoring in EPA's NSPS and NESHAP Regulations

Ned Shappley

USEPA OAQPS AQAD MTG

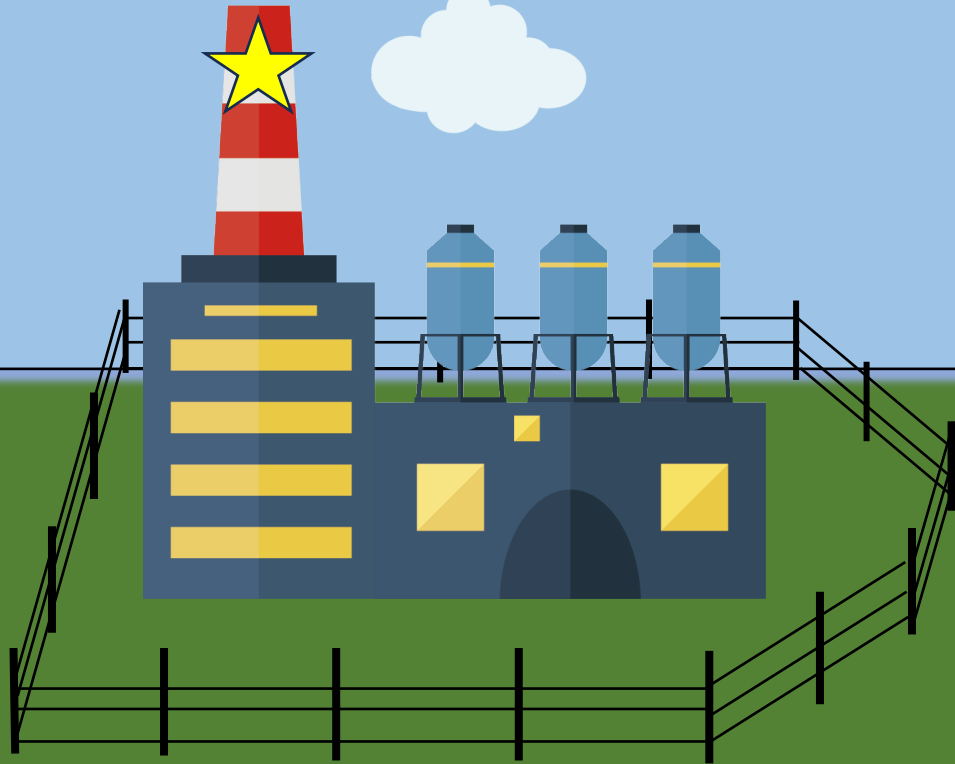
National Ambient Air Monitoring Conference

August 15, 2024

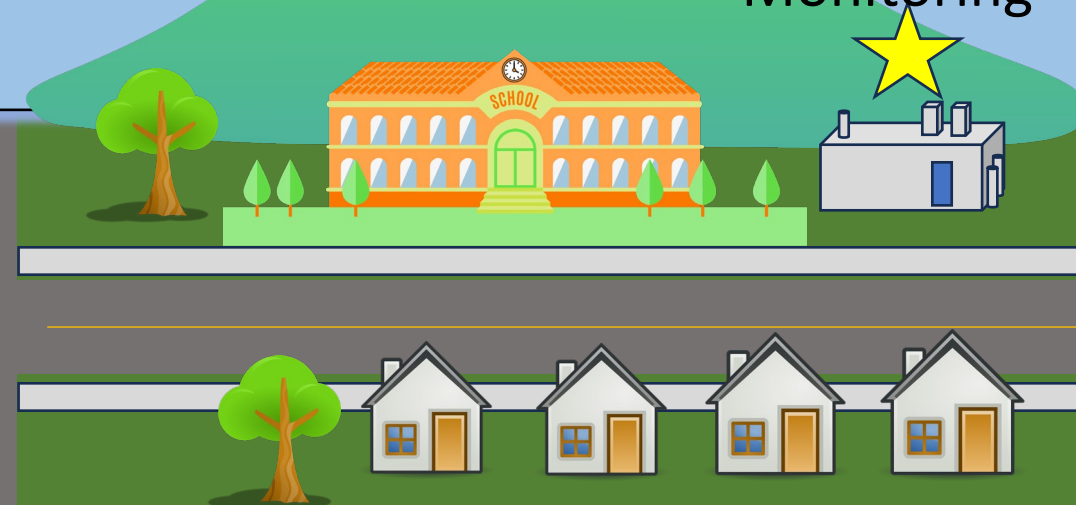
Topics

- New remote sensing technologies in use in the Stationary Source Program.
- EPA's Expanded Regulatory Fenceline Program
- EPA's Super Emitter Program
- Public data streams from the stationary source program that can assist understanding of ambient measurements.

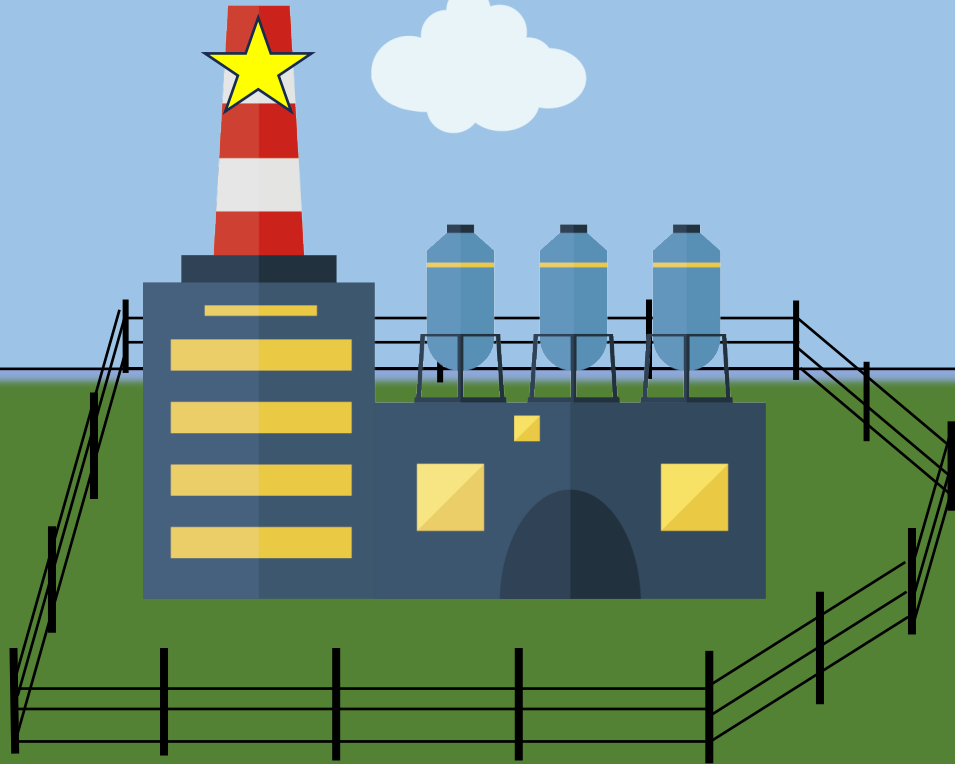
Stationary Source Measurements



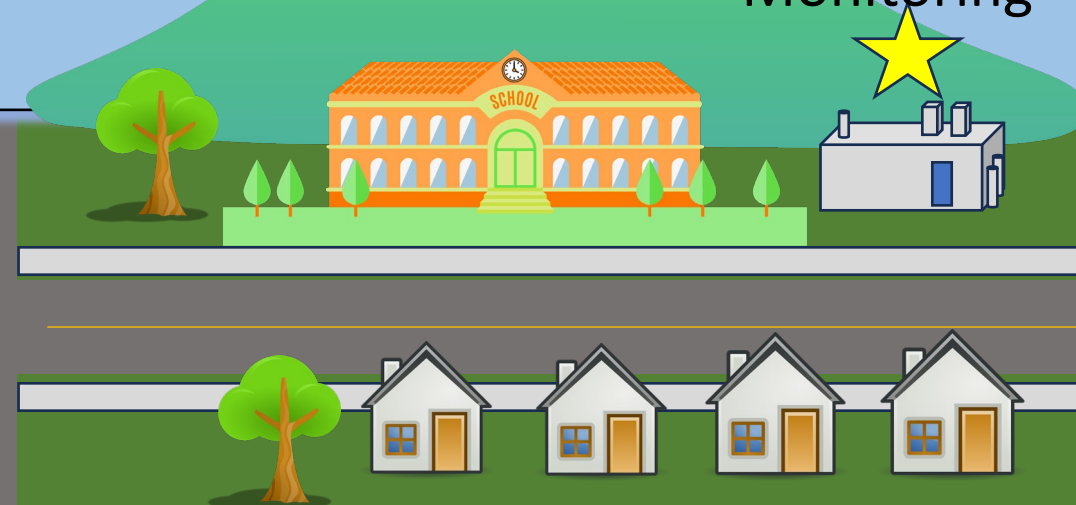
Ambient Community Monitoring



Stationary Source Measurements



Ambient Community Monitoring



EMC

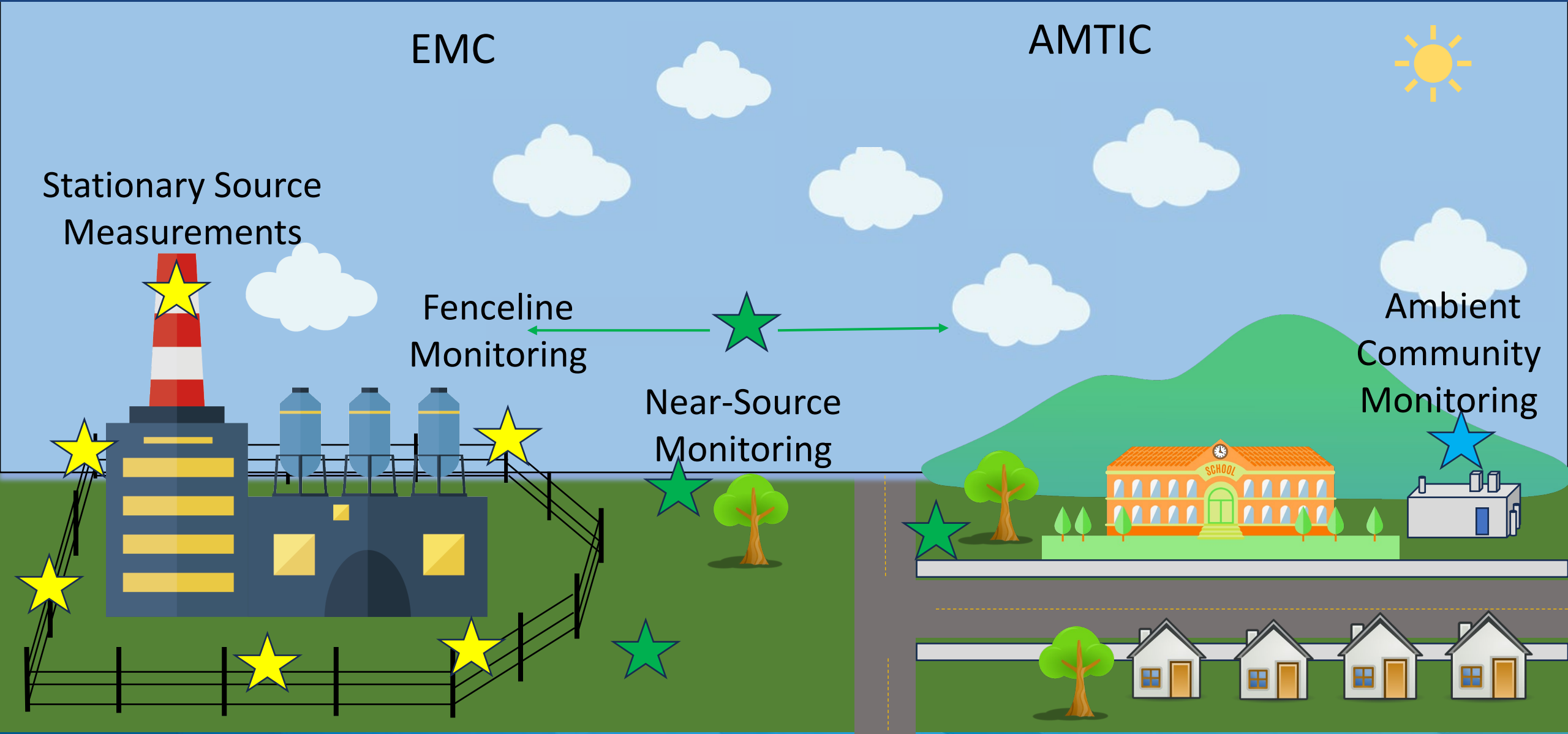
AMTIC

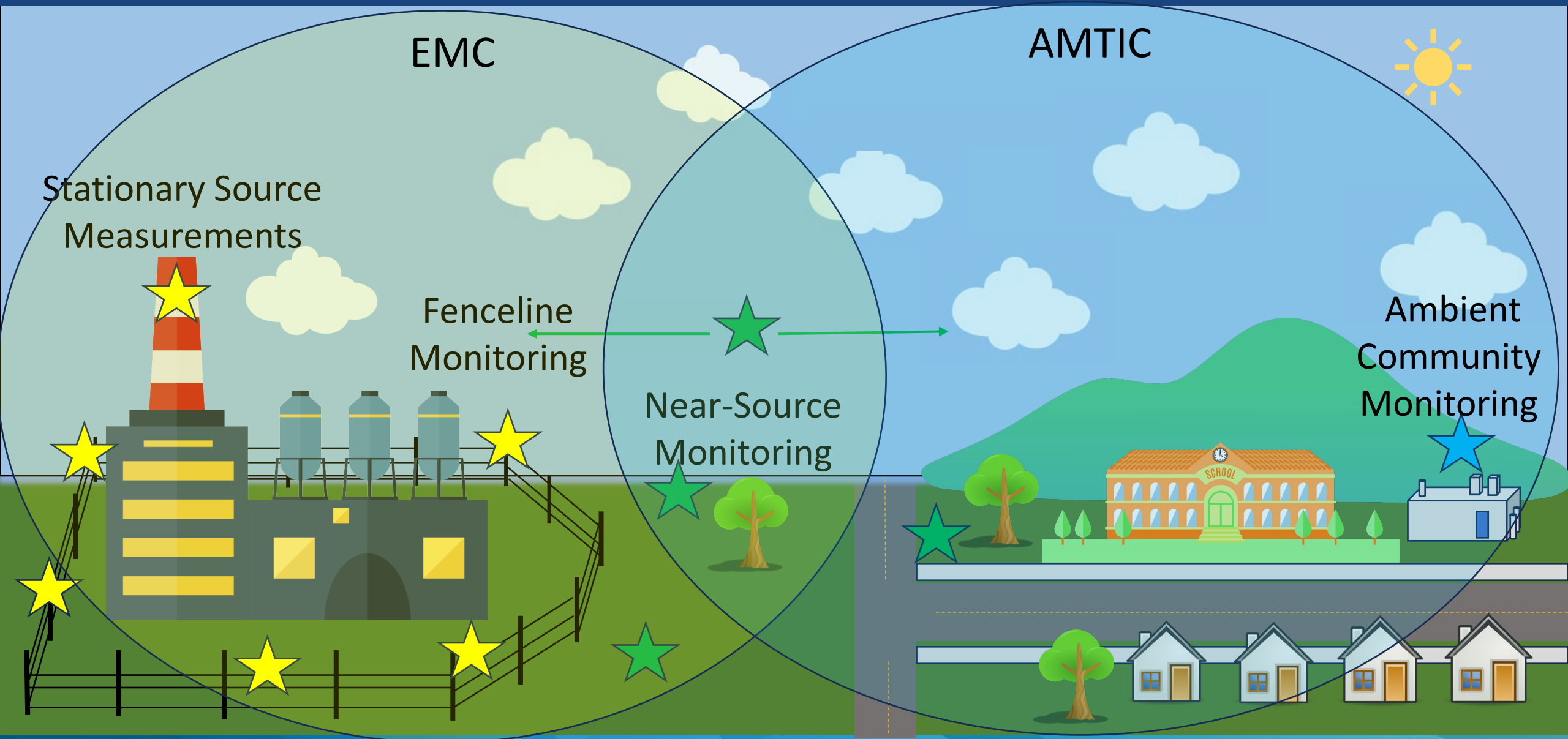
Stationary Source Measurements

Fenceline Monitoring

Near-Source Monitoring

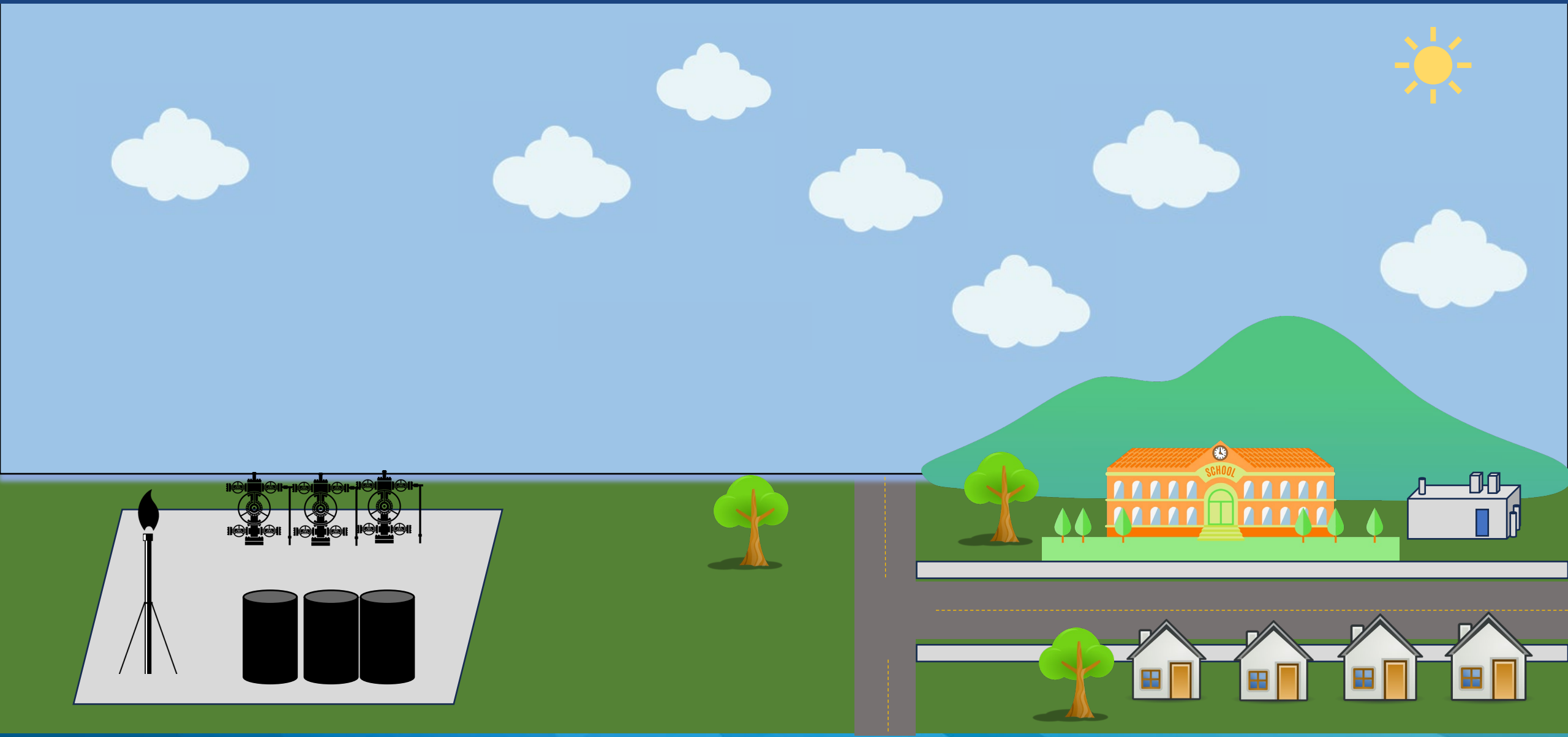
Ambient Community Monitoring





Next Generation Tools in New Source Performance Standards (NSPS) - 0000b

Alternative Technology - Methane Program



This Photo by Unknown Author is licensed under [CC BY-NC](#)



This Photo by Unknown Author is licensed under [CC BY-NC](#)

Alternative Technology - Methane Program

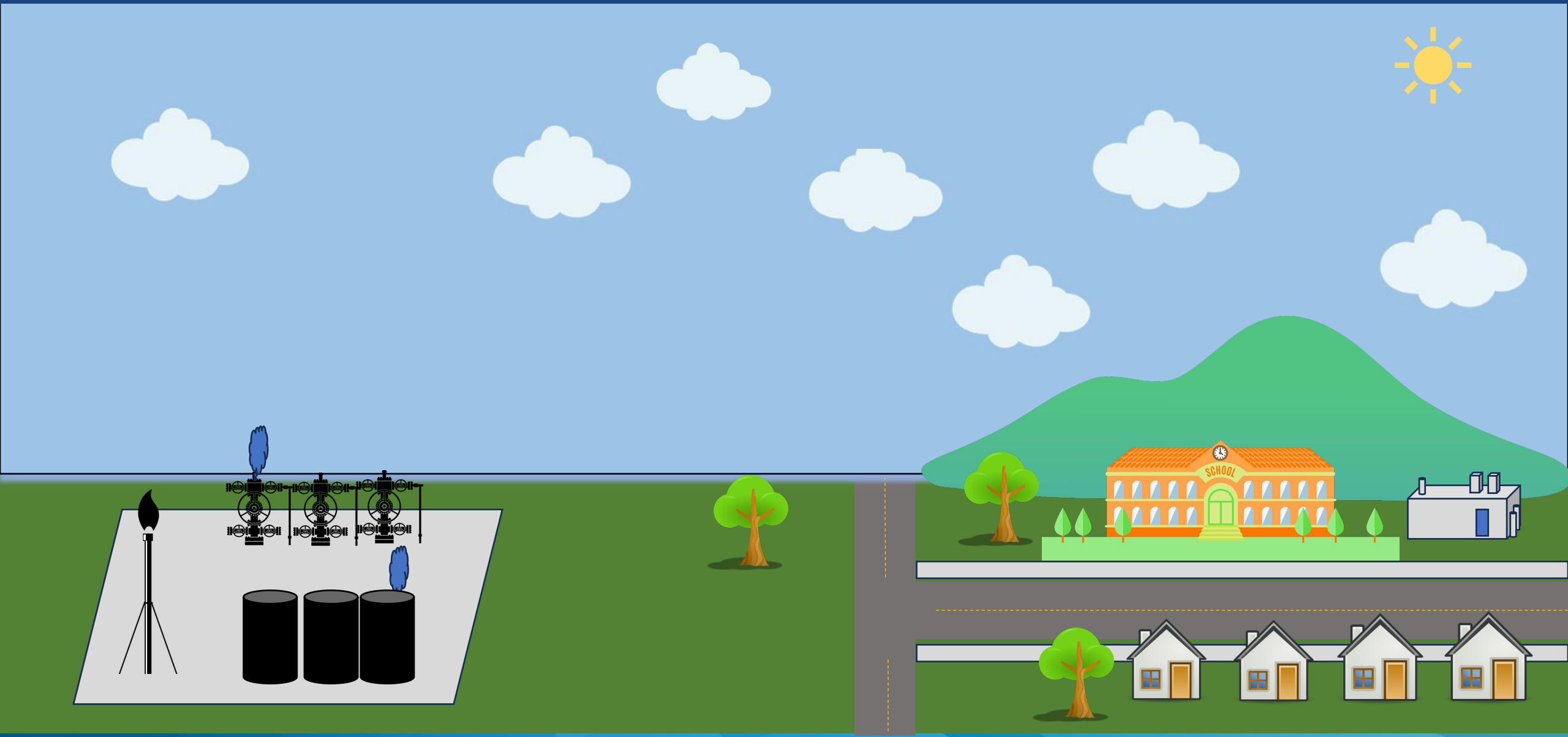


This Photo by Unknown Author is licensed under [CC BY-NC](#)



This Photo by Unknown Author is licensed under [CC BY-NC](#)

Alternative Technology - Methane Program – Periodic Screening

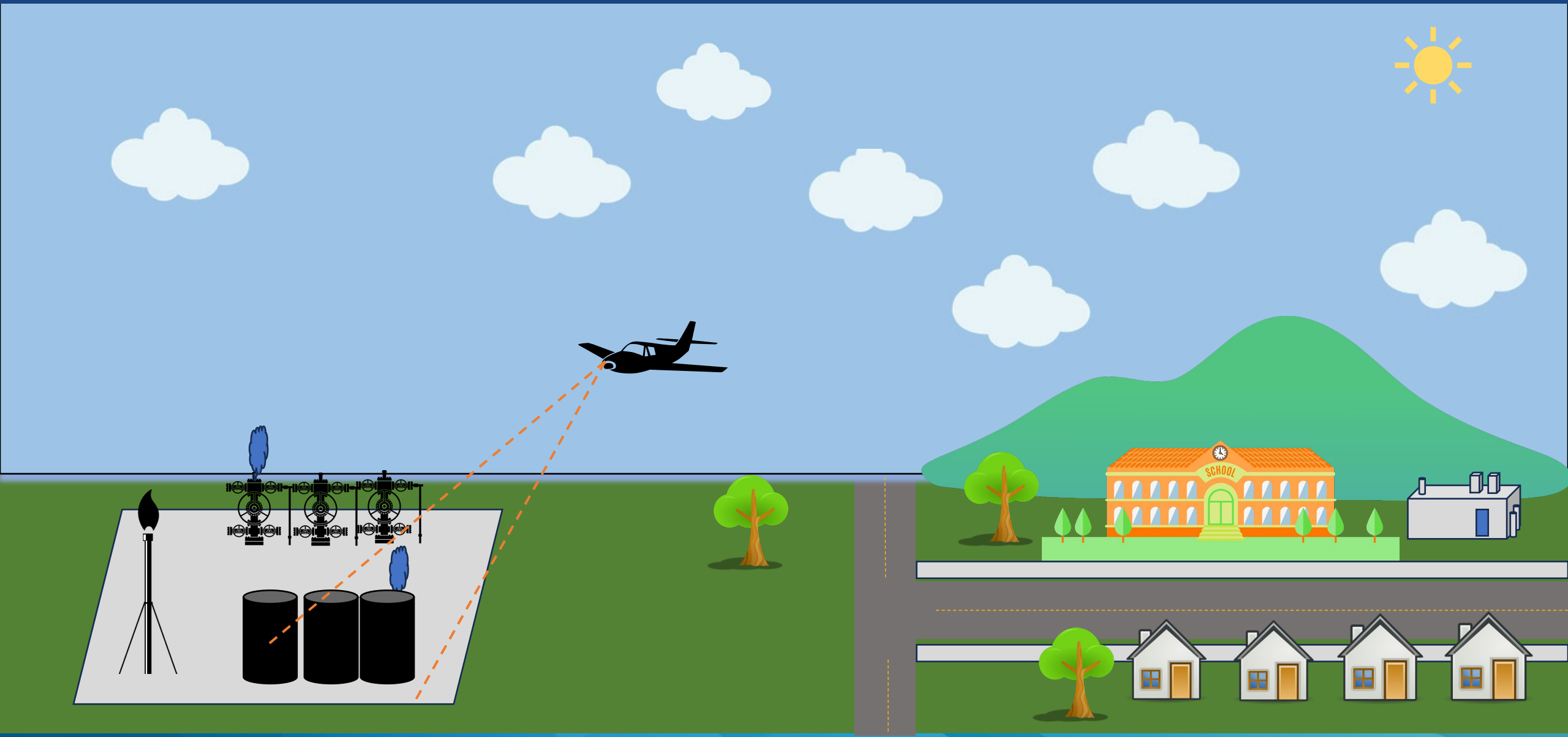


This Photo by Unknown Author is licensed under [CC BY-NC](#)



This Photo by Unknown Author is licensed under [CC BY-NC](#)

Alternative Technology - Methane Program – Periodic Screening

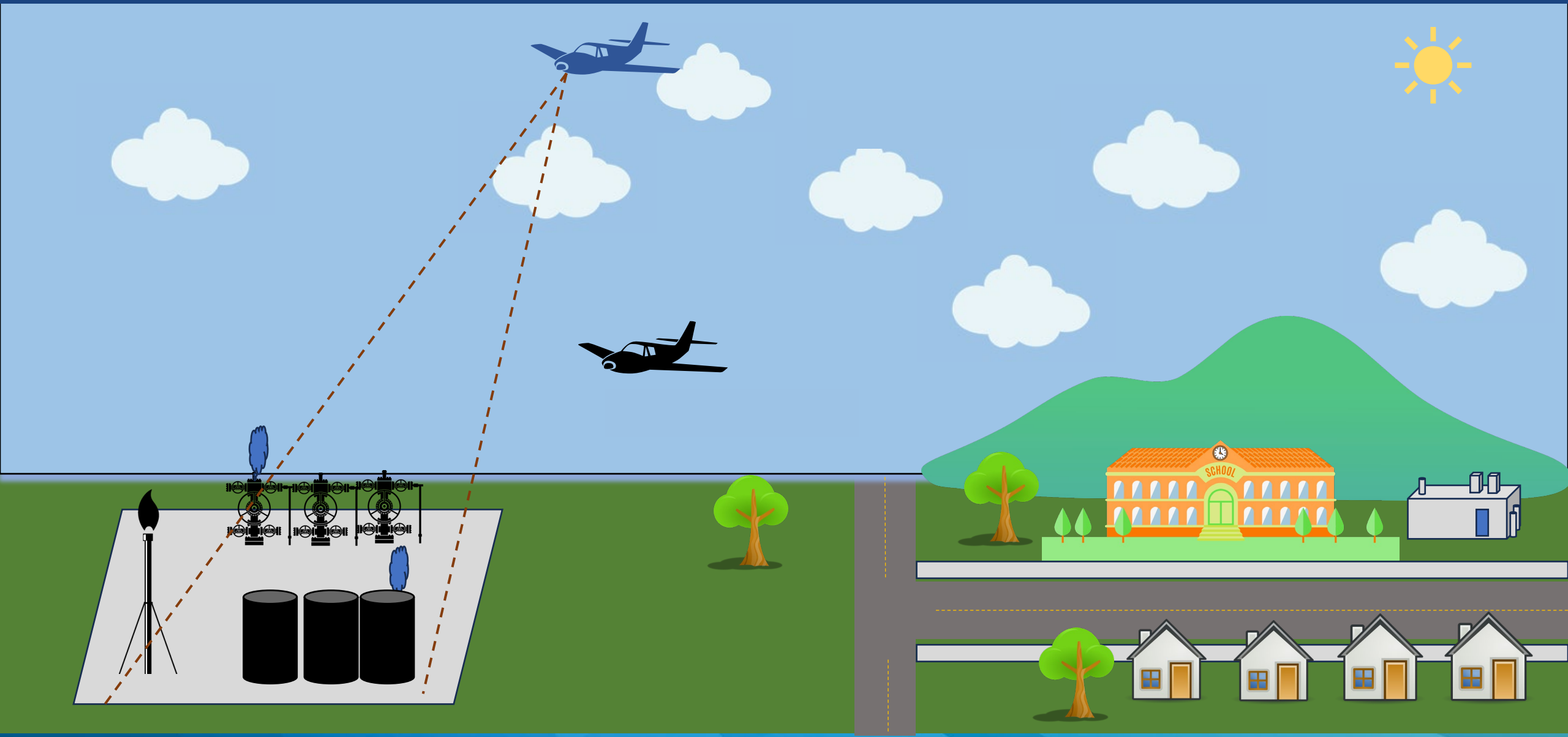


This Photo by Unknown Author is licensed under [CC BY-NC](#)



This Photo by Unknown Author is licensed under [CC BY-NC](#)

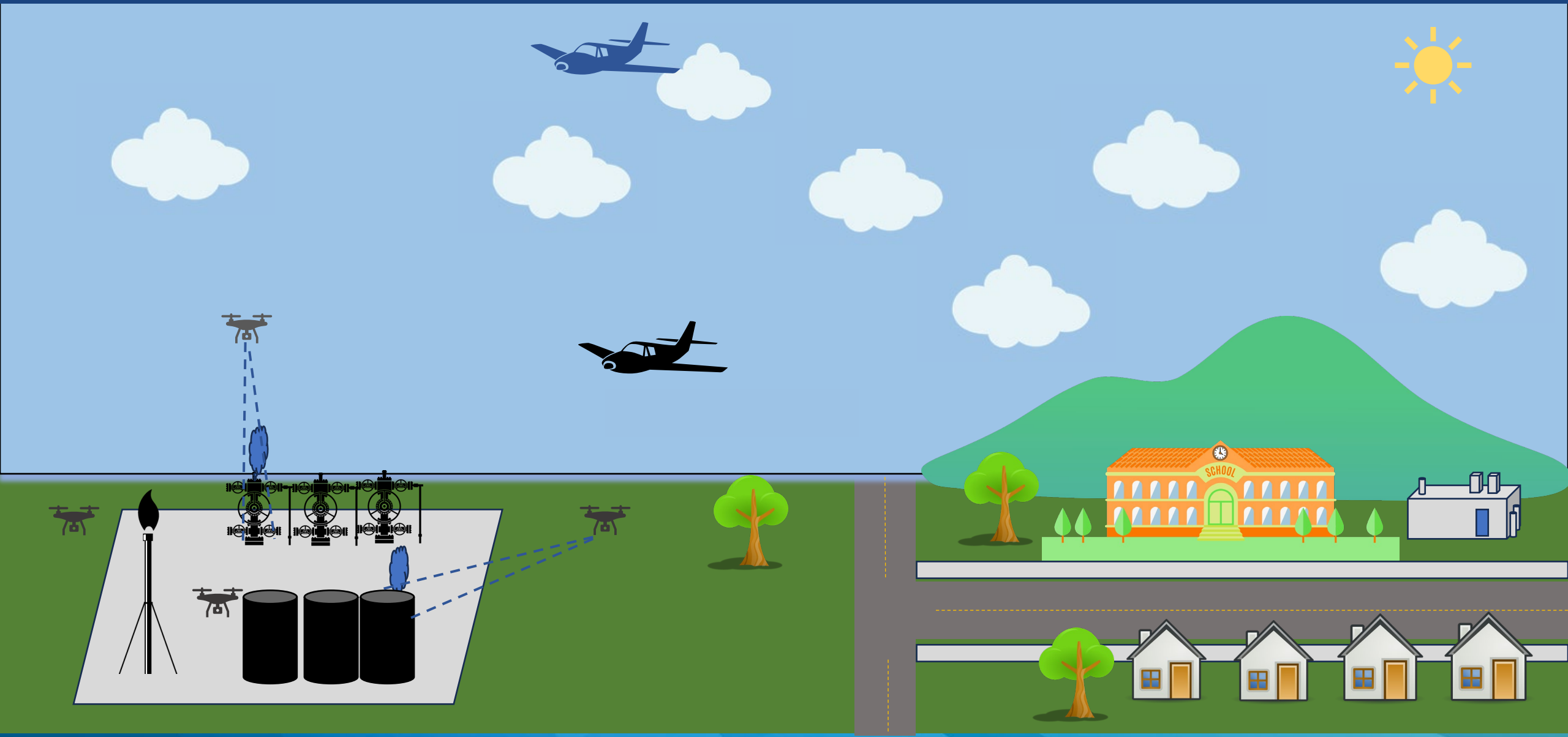
Alternative Technology - Methane Program – Periodic Screening



This Photo by Unknown Author is licensed under [CC BY-NC](#)

This Photo by Unknown Author is licensed under [CC BY-NC](#)

Alternative Technology - Methane Program – Periodic Screening



This Photo by Unknown Author is licensed under [CC BY-NC](#)

This Photo by Unknown Author is licensed under [CC BY-NC](#)

Alternative Technology - Methane Program – Periodic Screening



This Photo by Unknown Author is licensed under [CC BY-NC](#)



This Photo by Unknown Author is licensed under [CC BY-NC](#)

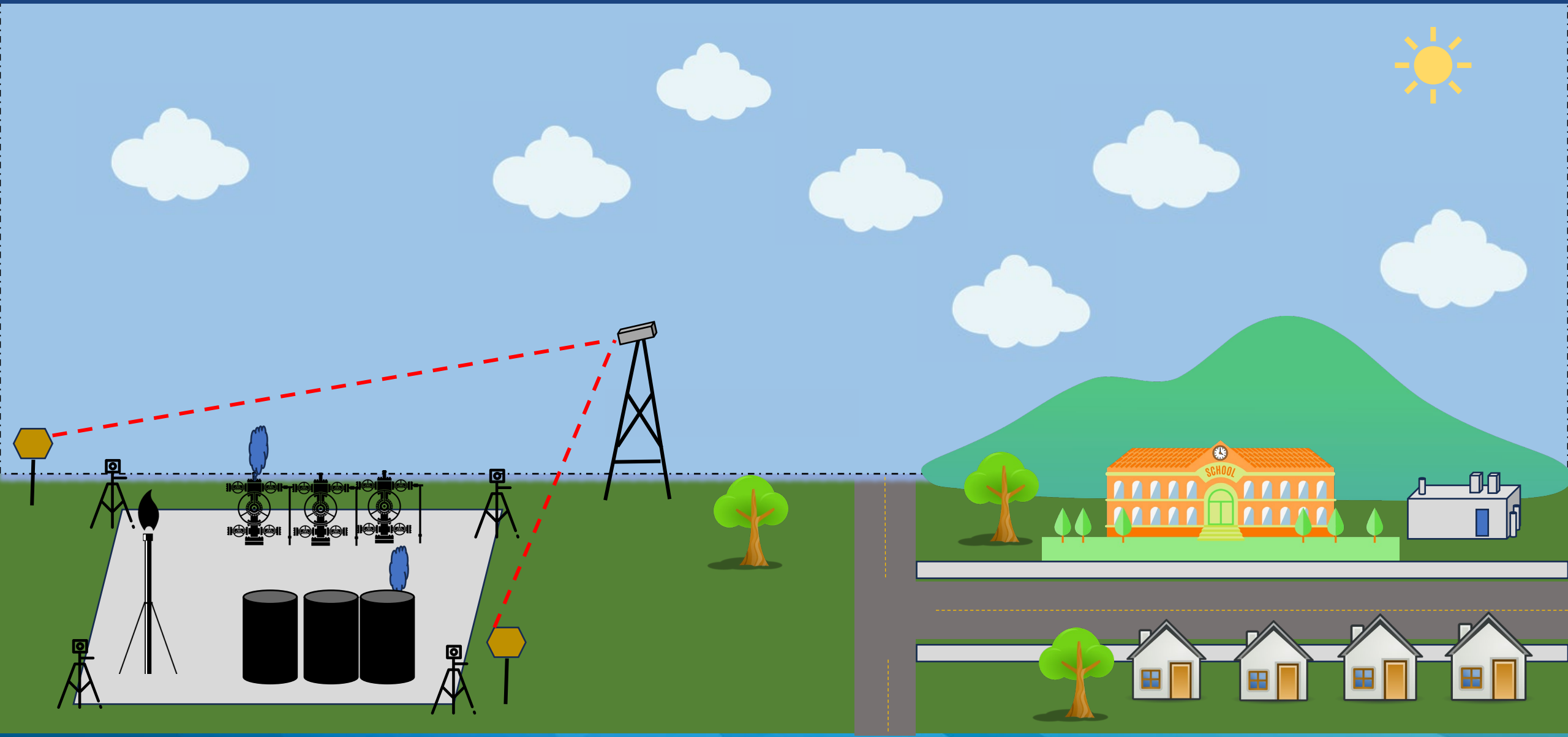
Alternative Technology - Methane Program – Periodic Screening



This Photo by Unknown Author is licensed under [CC BY-NC](#)

This Photo by Unknown Author is licensed under [CC BY-NC](#)

Alternative Technology - Methane Program – Continuous Monitoring



This Photo by Unknown Author is licensed under [CC BY-NC](#)

This Photo by Unknown Author is licensed under [CC BY-NC](#)

Oil and Natural Gas

Advanced Methane Technology Alternative Test Method



- Home
- New ATM Request
- Browse ATM Requests
- Approved ATM Requests
- Frequently Asked Questions
- Contact us

Alternative Test Method(s) Request Portal for the New Source Performance Standards and Emission Guidelines for Oil and Natural Gas Operations

EPA's final New Source Performance Standards and Emission Guidelines for Oil and Natural Gas Operations provide owners and operators the opportunity to use advanced monitoring technologies to meet certain requirements in the final rule.

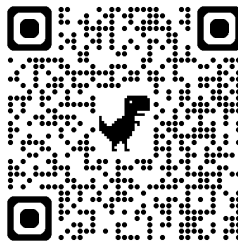
Use this site to submit Alternative Test Method (ATM) requests to the Administrator for approval under provisions outlined in [40 CFR 60.5398b\(d\)](#). These provisions incorporate specific criteria for the review, evaluation, and potential use of advanced methane detection technology for periodic screening, continuous monitoring, and/or super-emitter detection and are designed to facilitate state-of-the-art detection methods for emission sources. Technology providers, and oil and natural gas owners and operators may submit requests for alternative test methods to demonstrate the performance of advanced methane detection technologies.

Before creating a new request, please review the final rule and Guideline for Alternative Test Method Requests available on our web page at <https://www.epa.gov/emc/oil-and-gas-alternative-test-methods>, and the instructions for applying for an account to access the Methane Alternative Test Method Application Submission Portal at https://www.epa.gov/system/files/documents/2024-05/menthane-atm-register-with-epa.instructions-.pdf_0.pdf

Approved alternative test methods that are broadly applicable will be posted on EPA's [Air Emission Measurement Center](#) webpage.

Learn more about EPA's [rules for oil and natural gas operations](#).

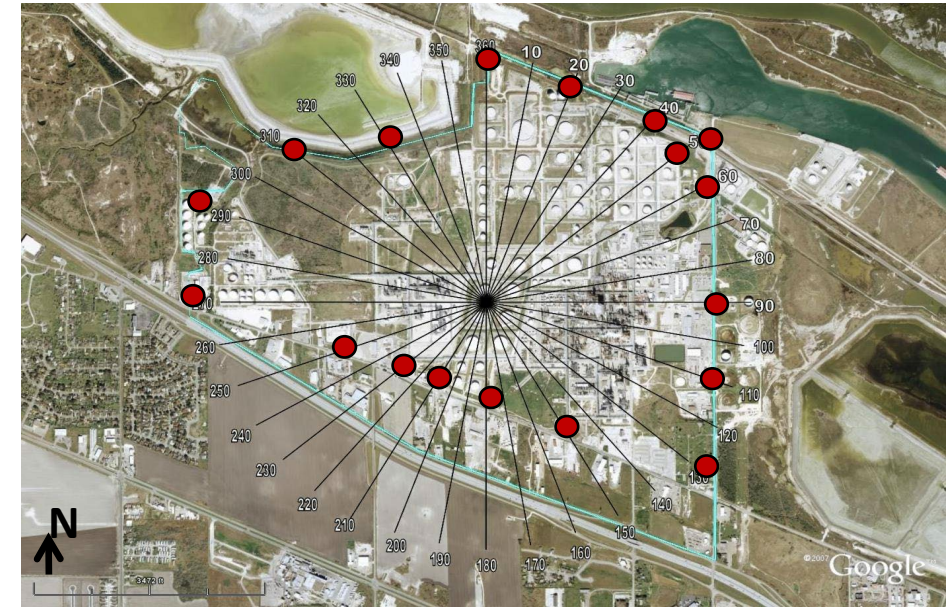
Methane.app.cloud.gov



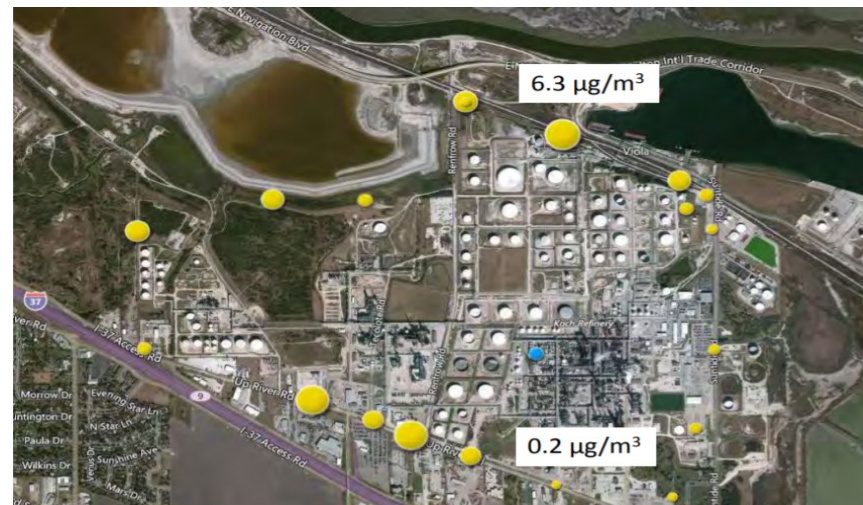
Fenceline Monitoring Expansion

What is Fenceline Monitoring ?

- Monitoring air concentrations of pollutant within the perimeter (e.g., at the fenceline) of U.S. facility.
- Measured from a height of 1.5m to 3m to target emissions from tanks and fugitive components
- Part of a “Work Practice” designed to trigger an action when a value is exceeded (e.g., Refinery MACT - annual rolling average 9.0 ug/m³ of benzene)



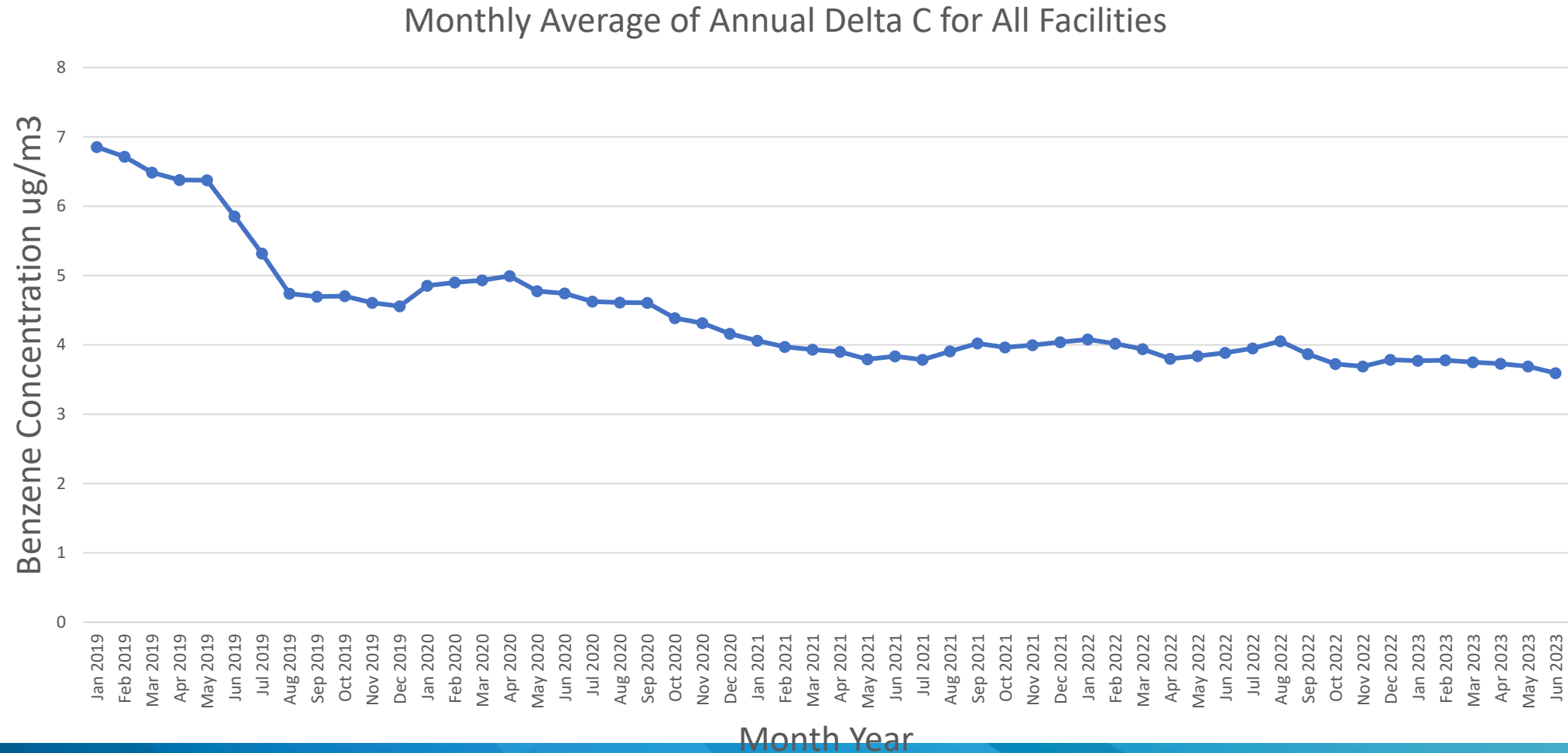
PS Sampler Example
PVC Pipe version with weatherproof hood



Range of Concentrations
a.k.a. Delta C =
(High Value – Low Value)

High Value – 6.3 ug/m³
Low Value – 0.2 ug/m³
 $\Delta C = 6.1 \text{ ug/m}^3$

Industry Wide Average ΔC since 2018 – Refinery Sector



Regulations with Fenceline Monitoring

Source Category	Rule Status	Target Analytes	Monitoring and Data Submission Timeline	Method
Petroleum Refinery Sector Part 63 Subpart CC	Final: December 1, 2015	Benzene	Ongoing, Quarterly	Method 325A/B - Benzene
Iron and Steel Manufacturing Part 63 Subpart FFFFF	Final: March 11, 2024	Total Chromium	Following promulgation of method rule	TBD
Synthetic Organic Chemical Manufacturing Industry (HON-SOCMI) Part 63 Subpart F, G, H, I	Final: May 16th, 2024	Benzene, 1,3-butadiene Ethylene dichloride Vinyl chloride Ethylene oxide (EtO) Chloroprene	Monitoring to begin 2-years following publication in FR (7/15/2026). The first quarterly report must be submitted once the owner or operator has obtained 12 months of data (11/14/2027)	Method 325A/B – benzene, 1,3 butadiene, ethylene dichloride, and chloroprene Method 327 – EtO and vinyl chloride
Coke Ovens Part 63 Subpart L	Final: July 5 th , 2024	Benzene Monitoring to begin no later than 7/7/2025. First quarterly electronic report expected no later than 11/14/2025.	Monitoring to begin no later than 7/7/2025. First quarterly electronic report expected no later than 11/14/2025.	Method 325A/B - Benzene

Clean Air Act 114 Requests

Rulemaking was supported through fence-line monitoring conducted by Industry.

- Chemical Sector CY 2022-2023, targeted oHAPs
- Integrated Iron and Steel – CY 2022, 5 Sites, 6 months of data
- Coke Ovens – CY 2022 - 2023, 5 Sites, 6 months of data, speciated oHAPs; including PAHs
- Secondary Lead CY 2024(on-going)

Information on these efforts are available through the rule FR dockets

Coke Ovens

Benzene Fenceline Concentrations (Average Delta C), ug/m³

Company	DTE/EES	US Steel	ABC Coke	Sun Coke	Cleveland Cliffs
Facility	Zug Island	Clariton	Birmingham	Haverhill	Burns Harbor
Method 325B	2	40	15	0.1	3
TO-15	1	35	8	0.2	1

Napthalene Fenceline Concentrations (Average Delta C), ug/m³

Company	DTE/EES	US Steel	ABC Coke	Sun Coke	CC
Facility	Zug Island	Clariton	Birmingham	Haverhill	Burns Harbor
TO-15A	0.4	9	1	0.00	1.1
TO-13	0.6	12	1	0.01	0.4

EPA-HQ-OAR-2003-0051-0735

Integrated Iron and Steel

Total Chromium (Average Highest Monitor) – ug/m3

Company	Cleveland Cliffs	US Steel	Cleveland Cliffs	US Steel
Facility	Burns Harbor	Granite City	Cleveland	Gary
Method -IO.3	0.029	0.0946	0.079	0.16

EPA-HQ-OAR-2002-0083-1502

Chemical Sector

Method 325B-Benzene Concentration – ug/m3

Company	Facility	Average of All Monitors	Max Monitor
BASF	Geismar Site	0.65	3.8
Dow Chemical	Louisiana Operation	0.96	4.15
Dow Chemical	Texas Operation	0.45	2.11
Eastman	Eastman -Texas Op	1.01	4.20
Formosa	Point Comfort Plant	0.84	6.64
Indorama	Port Neches	0.91	4.20
Sasol	Lake Charles Chemical Complex	0.65	1.88
Union Carbide	St. Charles	1.08	4.68

EPA-HQ-OAR-2003-0730-0091

Chemical Sector

Method 325B-1,3 Butadiene Concentration – ug/m3

Company	Facility	Average of All Monitors	Max Monitor
Denka*	LaPlace	0.46	72.1
Dow Chemical	Louisiana Operation	ND	ND
Dow Chemical	Texas Operation	0.63	2.82
Eastman	Eastman -Texas Op	ND	ND
Formosa	Point Comfort Plant	0.65	5.09
Indorama	Port Neches	0.32	ND
Sasol	Lake Charles Chemical Complex	0.70	1.76
Union Carbide	St. Charles	0.62	0.622

EPA-HQ-OAR-2003-0730-0091

* Collected as part of separate ICR, CY 2022 data

Chemical Sector

Method 325B- Chloroprene Concentration – ug/m3

Company	Facility	Average of All Monitors	Max Monitor
Denka*	LaPlace	0.78	10.1

Method 325B-Ethylene Dichloride Concentration – ug/m3

Company	Facility	Average of All Monitors	Max Monitor
Dow Chemical	Louisiana Operation	1.03	5.43
Dow Chemical	Texas Operation	0.27	0.544
Formosa	Point Comfort Plant	4.14	56.8
Union Carbide	Lake Charles Chemical Complex	ND	ND
Union Carbide	St. Charles	ND	ND

EPA-HQ-OAR-2003-0730-0091

* Collected as part of separate ICR, CY 2022

Chemical Sector

“Optimized TO-15A” – Ethylene Oxide Concentration – ug/m3

Company	Facility	Average of All Monitors	Max Monitor
BASF	Geismar	0.14	0.49
Dow Chemical	Louisiana Operation	0.32	3.31
Dow Chemical	Texas Operation	0.28	4.72
Eastman	Eastman -Texas Op	0.16	0.67
Formosa	Point Comfort Plant	0.18	1.8
Huntsman	Conroe	0.45	2.9
Indorama	Port Neches	1.4	23
Sasol	Lake Charles Chemical Complex	0.18	0.66
Union Carbide	Seadrift	0.32	2.21
Union Carbide	St. Charles	0.72	3.93

EPA-HQ-OAR-2003-0730-0091

Chemical Sector

“Optimized TO-15A” –Vinyl Chloride Concentration – ug/m3

Company	Facility	Average of All Monitors	Max Monitor
Dow Chemical	Louisiana Operation	0.41	2.77
Dow Chemical	Texas Operation	0.16	0.269
Formosa	Point Comfort Plant	2.39	112
Union Carbide	Seadrift	ND	ND

EPA-HQ-OAR-2003-0730-0091

* Collected as part of separate ICR

Fenceline Reporting - Fenceline Monitoring Dashboard

Refinery Profile

CAA Current Compliance Status: No Violation Identified
Site Specific Monitoring Plan?: N

Selected View

Selected View: Most Recent Annual Avg ΔC
Period Start Date: 9/5/2023
Period End Date: 9/19/2023
Sampling Period ΔC: 9
Annual Avg. ΔC: 17.75

Exceedance Status (based on most recent sampling period results)
Exceedance for Annual Average ΔC: Y
Exceedance for Sampling Period ΔC: N

Selected Refinery

Monitors Monitor Trend

Monitored Benzene Concentrations

Annual Average Annual Average Trend
Sampling Period Sampling Period Trend

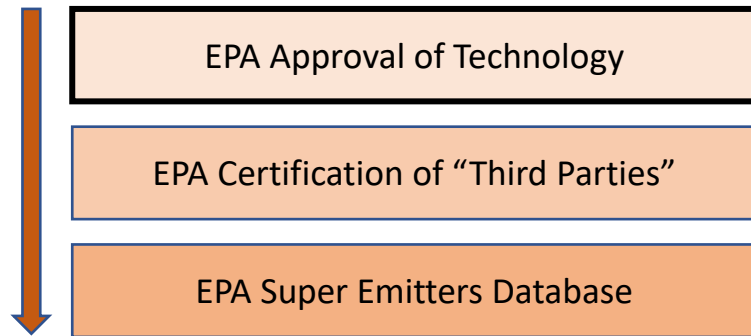
Annual Average ΔC

	Dec 2023	Oct 2023	Sep 2023	Aug 2023	Jul 2023	Jun 2023	May 2023	Apr 2023	Mar 2023	Feb 2023	Jan 2023	Dec 2022	Nov 2022	Oct 2022	Sep 2022
Chalmette Refining, LLC	-	-	17.75 ▲	18.14 ▲	18.91 ▲	19.12 ▲	21.9 ▲	21.2 ▲	20.89 ▲	19.9 ▲	17.74 ▲	16.63 ▲	15.62 ▲	15.22 ▲	15.08 ▲
TotalEnergies Refinery	-	-	15.7 ▲	16.31 ▲	16.52 ▲	16.8 ▲	16.78 ▲	19.07 ▲	19.42 ▲	19.29 ▲	19.47 ▲	19.22 ▲	15.74 ▲	15.75 ▲	15.18 ▲
Deer Park Refinery	-	-	14.8 ▲	15.5 ▲	15.5 ▲	15.2 ▲	15.1 ▲	12.4 ▲	12 ▲	11.8 ▲	11.9 ▲	11.5 ▲	12.4 ▲	12.2 ▲	11.7 ▲

https://awsedap.epa.gov/public/extensions/Fenceline_Monitoring/Fenceline_Monitoring.html?sheet=MonitoringDashboard

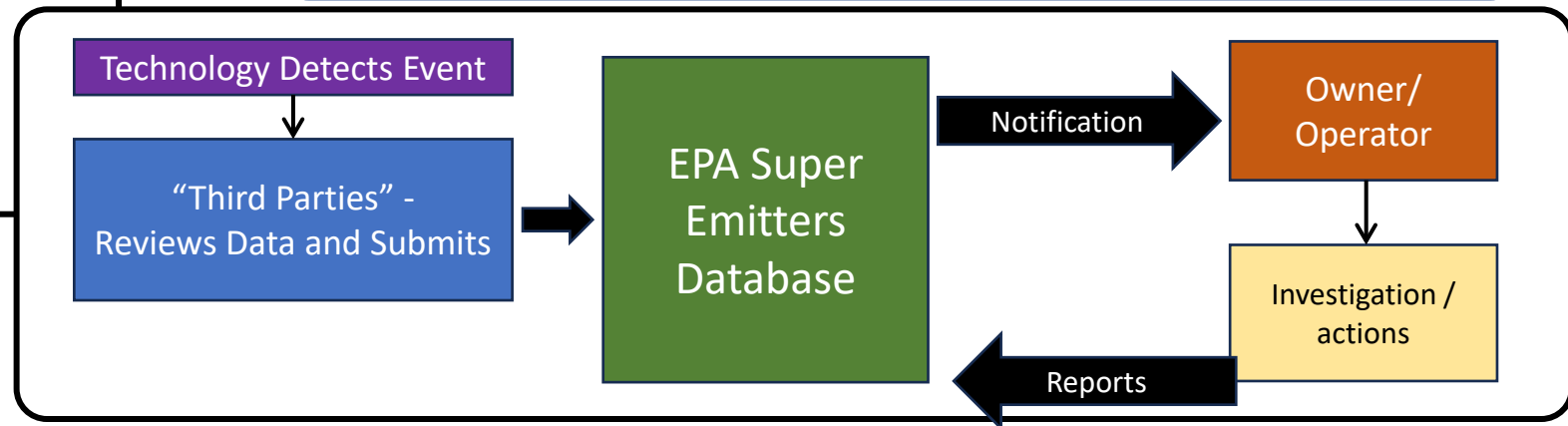
Super Emitter Program for Methane

The EPA Super Emitters Program is a Clean Air Act regulatory detection and notification program for methane super emitter events



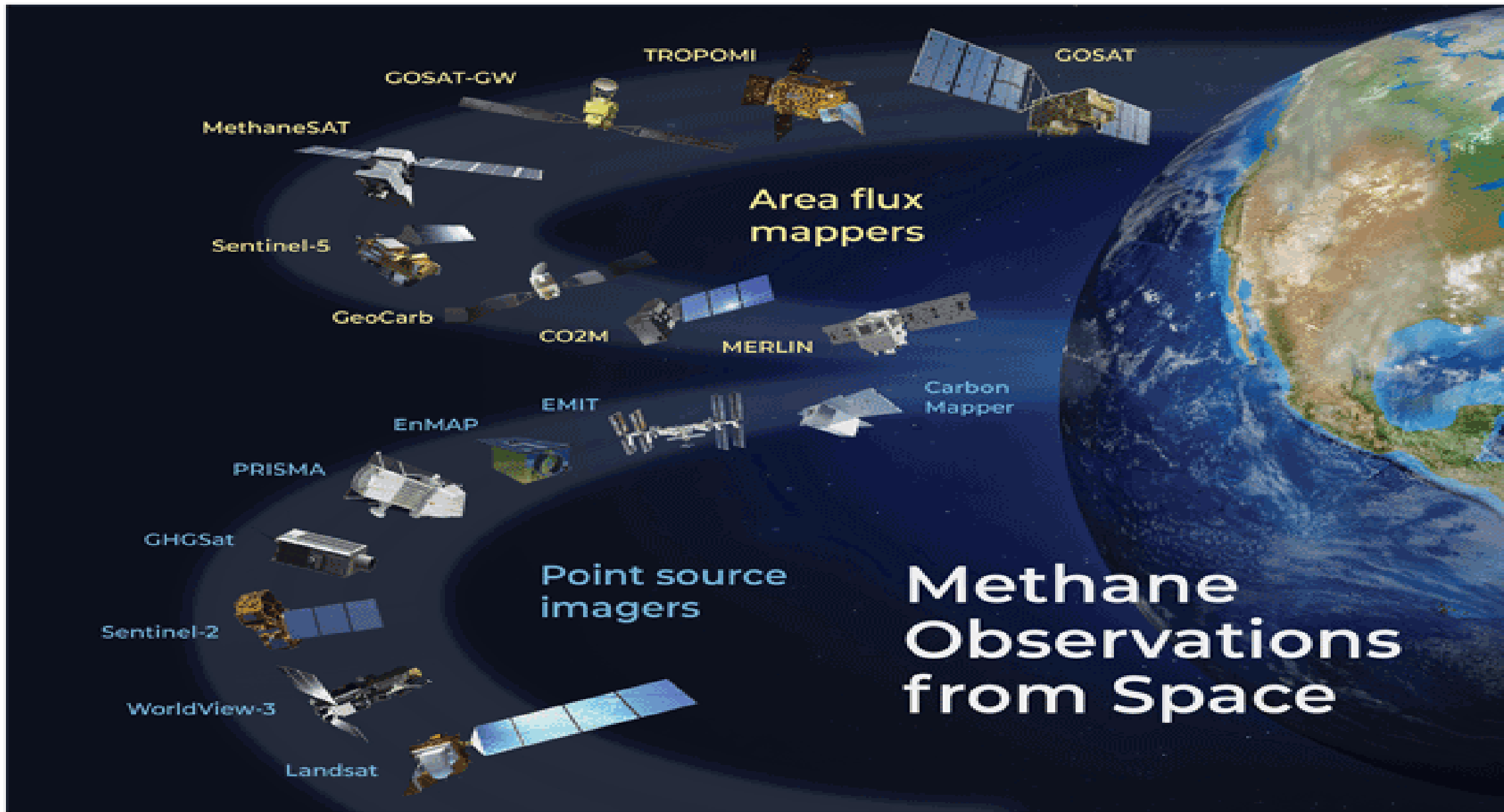
EPA will provide a strong oversight role and ensure the program operates with a high degree of integrity, transparency, and accountability

Only EPA-approved remote-sensing technologies may be used.



Underlying Assumptions:

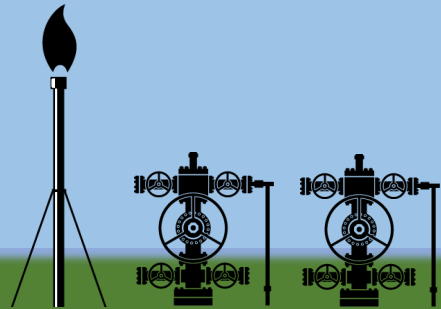
- Submitted technology applications will primarily be from Satellite Platforms
- We are not assessing the satellites detectors themselves;
- Satellites will primarily be solar backscatter methodology (SWIR)
- We are evaluating general data retrieval approach, not individual data cases
- Technology vendors will also be those submitting information (Third party)



Methane Observations from Space



EPA's Super Emitter Program



Oil and Natural Gas Facility



Technology Provider/Third-Party Notifier



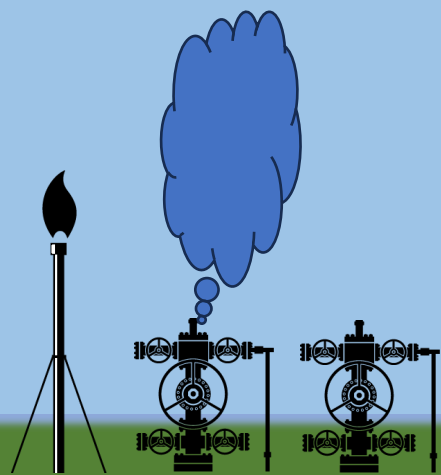
Owner or Operator



Super Emitter Portal



EPA's Super Emitter Program



Oil and Natural
Gas Facility



Technology Provider/Third-
Party Notifier

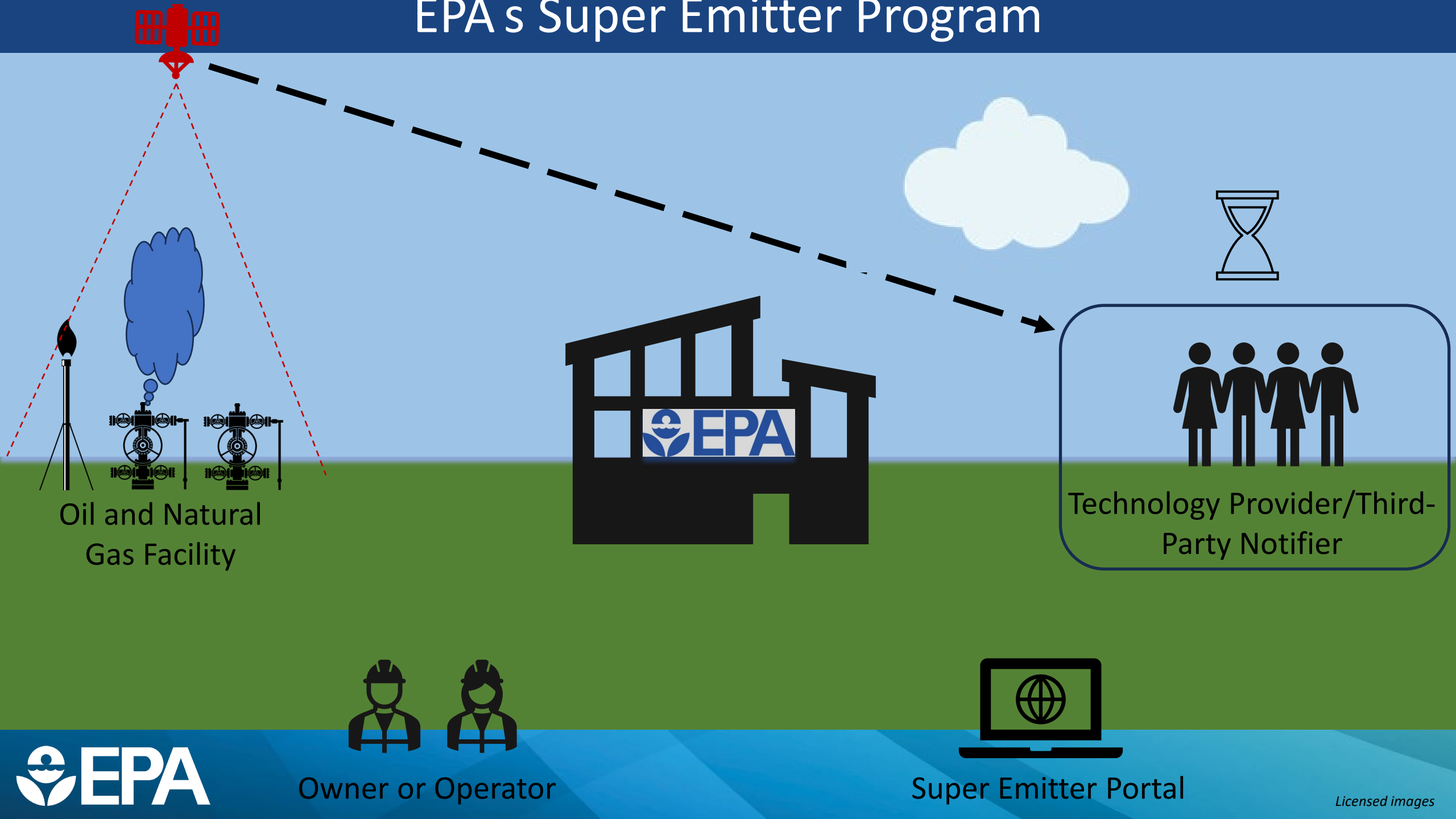


Owner or Operator



Super Emitter Portal

EPA's Super Emitter Program



Oil and Natural Gas Facility

EPA

Technology Provider/Third-Party Notifier

Owner or Operator

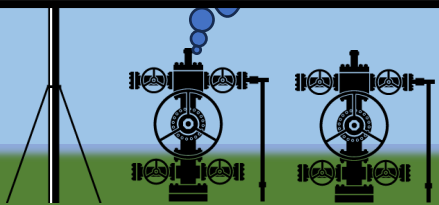
Super Emitter Portal



EPA's Super Emitter Program

Information included but not limited to :

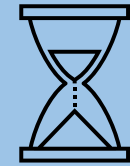
- Date of detection
- Location of event in *latitude and longitude* coordinates
- Documentation (*i.e. imagery*) depicting the detected event
- Emission rate of the event in kg/hr
- Attestation statement



Oil and Natural Gas Facility



Report within 15 days of detection



Technology Provider/Third-Party Notifier



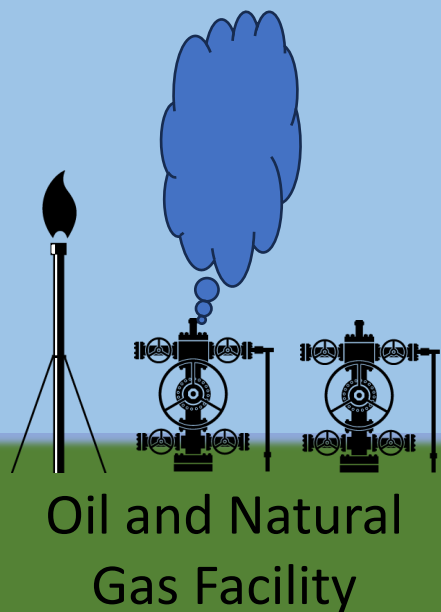
Owner or Operator



Super Emitter Portal

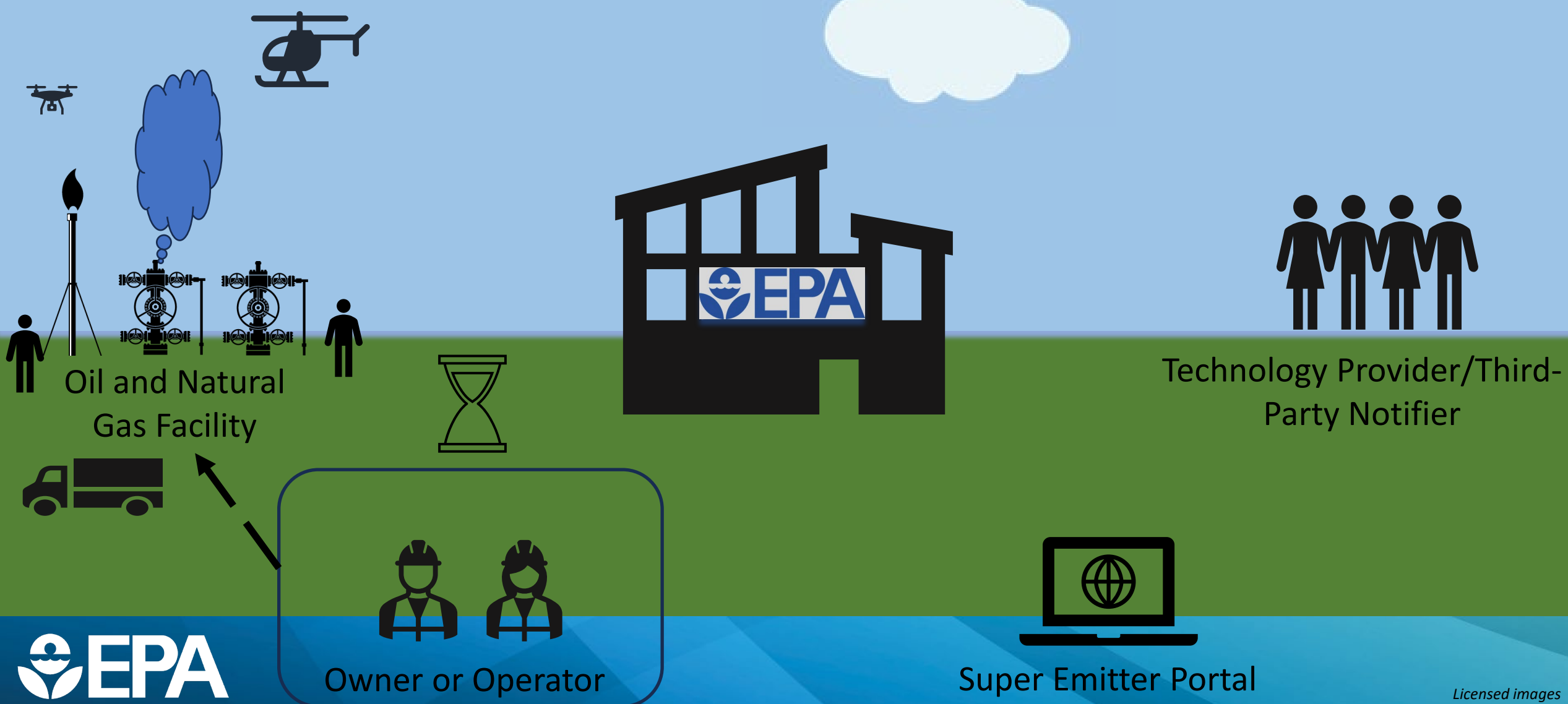


EPA's Super Emitter Program



EPA's Super Emitter Program

Must initiate an investigation with **5 days** and report the results to EPA within **15 days**.

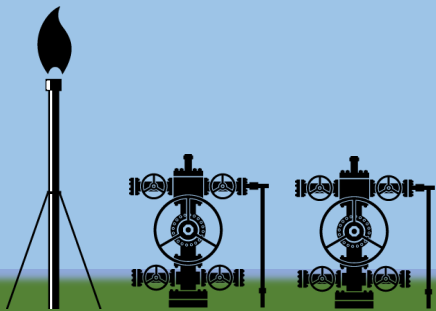


EPA's Super Emitter Program

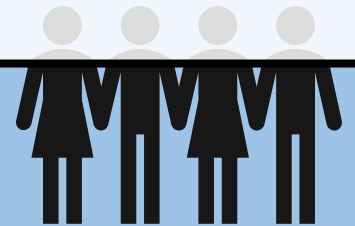
Must initiate an investigation with **5 days** and report the results to EPA within **15 days**.

Reports included but not limited to :

- General identification for the facility and what regulations they are subject to
- Information of the investigations performed
- If leak was found, **the end** of Super Emitter event



Oil and Natural Gas Facility



Technology Provider/Third-Party Notifier



Owner or Operator



Super Emitter Portal



Methane Super Emitter Data Explorer

Help Documentation

Filter Data x

Event Characteristics

Event Status

No Restrictions v

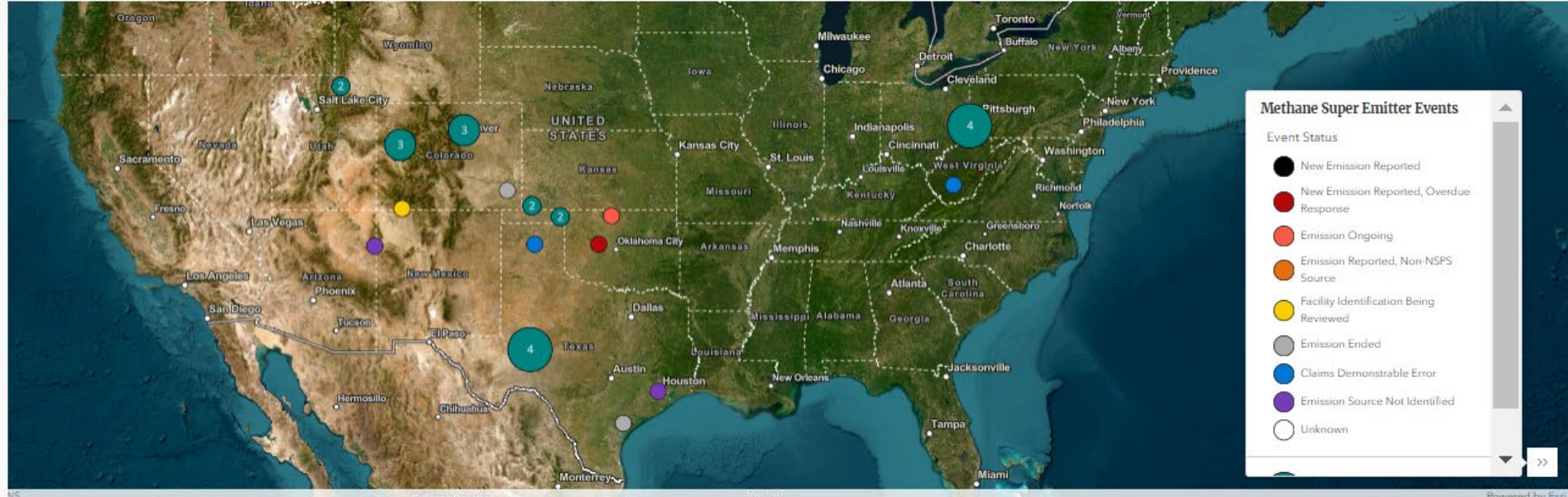
Methane Leak Amount (kg)

Minimum Maximum

Detection Date Range

End Date Range

Response Date Range



Currently viewing 29 events

Emissions Notification ID	Event Status	Date of Detection	Date of Notification	Date of Response	End Date	Facility Name
123467	Emission Ongoing	12/30/2022, 4:00:00 PM	6/21/2023	7/21/2023, 5:00:00 PM	7/21/2024, 5:00:00 PM	ET GATHERING PROCESSING LLC / BEAVER GAS PLANT
123466	New Emission Reported, Overdue Response	12/29/2022, 4:00:00 PM	6/5/2023	7/9/2023, 5:00:00 PM	5/9/2024, 5:00:00 PM	DOUGLAS GAS PLANT (TALLGRASS MIDSTREAM)
123481	Emission Source Not Identified	12/29/2022, 4:00:00 PM	11/14/2023	11/19/2023, 4:00:00 PM	11/9/2024, 4:00:00 PM	STORK STATION



Ned Shappley

919.541.7903

shappley.ned@epa.gov

Thank You and Questions?