

PROPOSED RULE 1118.1 -

Control of Emissions from Non-Refinery Flares

Working Group Meeting #5

April 4, 2018

SCAQMD Headquarters – Conference Rm GB
Diamond Bar, California

RULE PROCESS

- 5 Working Group Meeting from August 2017 to April 2018
- 18 Site Visits

Industry	Number of Visits
Landfills	6
Wastewater Treatment	6
Oil and Gas	6

- Released preliminary draft rule language March 4, 2018
- Received 3 formal comment letters

KEY STAKEHOLDER COMMENTS RECEIVED

Comment

Rule should distinguish emergency, backup, and routine flaring.

Disaggregate three major industries (oil and gas, landfills, waste water).

Response

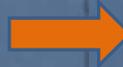
Rule provides allowances for low-use (<200 hours/year) and low-emitting (<1 lb/day) flares.

Each industry shares similar control technologies and opportunities, albeit possibly different interim actions may be required, such as different levels of gas clean up.

KEY STAKEHOLDER COMMENTS RECEIVED (cont.)

Comment

Backup flares are justified for landfill gas and digester gas because of low quality, low BTU content, and higher concentration of impurities.



Response

- Backup *capacity* is needed but not backup flares. Alternative technologies and services exist to handle backup and emergency gas.

Additionally:

- The proposal allows for flares that comply with Table 1 emission limits.
- Biogas clean up for beneficial use is feasible and the EPA Renewable Fuel Standard and the California Air Resources Board Low Carbon Fuel Standard credits will help offset costs.
- Renewable natural gas has low carbon intensity which increases it's market value.

KEY STAKEHOLDER COMMENTS RECEIVED (cont.)

Comment

Routine flaring should be prohibited and backup flaring for oil and gas extraction should be limited.

20 year phase out is too lax for oil and gas industry, they should be required to use gas beneficially immediately and be required to only use ultra-low NOx flares as backup.

Response



Most large oil producers do not routinely flare. Rule allows for routine and backup flaring but requires reduce emissions and increase beneficial use.



Most large oil producers already use the majority of their gas beneficially. Half of the oil and gas flares will have over 20 years of service within 5 years of rule adoption. Any flares installed after 2016 already meet the proposed emission limit.

KEY STAKEHOLDER COMMENTS RECEIVED (cont.)

Comment

Change (e)(2) from 90 days to 60 days (requirement to submit the source test protocol prior to the source test).

Add language to exempt a facility from Source Test Requirements and Source Test recordkeeping requirements if they use (d)(3) Beneficial Use Averaging Compliance Option.

Response

The 90 day requirement is necessary to ensure adequate time to conduct a thorough review. Once approved, protocol does not need to be re-submitted unless flare or emission limits have been altered.

Paragraph (e)(1) excludes (d)(3) from the Source Test requirements, thus facilities complying with (d)(3) would not be held to source test recordkeeping requirements.

KEY STAKEHOLDER COMMENTS RECEIVED (cont.)

Comment

Stronger incentives for beneficial use are needed.

For owners or operators of flares complying with the Beneficial Use Alternative Compliance Option, include an exemption for gas flared during upstream equipment malfunctions, maintenance, process upsets, emergency situations and/or safety concerns of operating personnel and equipment.

Response

Staff is open to suggestions for stronger incentives.

Beneficial Use Alternative Compliance Option intended to reduce flaring, exemption for any upset would not achieve this goal. Details of Beneficial Use Option will be included in Appendix A.

KEY STAKEHOLDER COMMENTS RECEIVED (cont.)

- Staff is currently working on changes in response to the following comments:

- Decreasing the Beneficial Use percentage
 - Will assist the Outer Continental Shore concerns
- Including an exemption for closed landfills that generate less than 1,000 MMscf/year
- Extending the time to replace a flare (d)(2) beyond 12 months
- Exempting gas used to maintain flare pilot from Beneficial Use provision
- Adding “or equivalent” to the ultrasonic meter requirement
- Reducing recordkeeping retention from (f)(8) to less than 5 years
- Adding “with energy recovery” to the end of flare definition

Stakeholder Suggested Change:

Compliance Date	Beneficial Use of Total Annual Captured Gas
7/1/2019	85%
7/1/2022	90%
7/1/2025	95 <u>92</u> %
7/1/2028	98 <u>95</u> %

KEY STAKEHOLDERS COMMENTS FOR DISCUSSION

- Suggested Flare definition change:

- First Suggestion

FLARE means a combustion device, whether at ground level or elevated, that uses a flame to burn combustible gases or vapors with combustion air provided by uncontrolled ambient air around the flame or a controlled combustion air blower without energy recovery.

- Second Suggestion (from 40 CFR 98.238 (Subpart W))

FLARE means a combustion device, whether at ground level or elevated, that uses an open or closed flame ~~to burn combustible gases or vapors with combustion air provided by uncontrolled ambient air around the flame or a controlled combustion air blower~~ without energy recovery.

KEY STAKEHOLDERS COMMENTS FOR DISCUSSION (cont.)

- Suggested change for demonstrating 200 hour/year use limitation:
 - Initial Language
For each flare demonstrating operating hours are less than 200 hours per year pursuant to subparagraph (d)(4)(C), maintain monthly recordkeeping of flare use using an installed calibrated non-resettable totalizing time meter.
 - Suggestion
For each flare demonstrating operating hours are less than 200 hours per year pursuant to subparagraph (d)(4)(C), maintain monthly recordkeeping of flare use using a 200-hour equivalent volume of permitted process gas flow measured by non-resettable fuel meter(s).

AFFECTED UNIVERSE

- Staff further analyzed the data to better assess
 - Number of flares that will potentially need to be replaced based on age, use, emissions, and existing Beneficial Use
 - Potential emission reductions and cost effectiveness
 - Limited data for Beneficial Use estimates, staff continues to compile and analyze available information



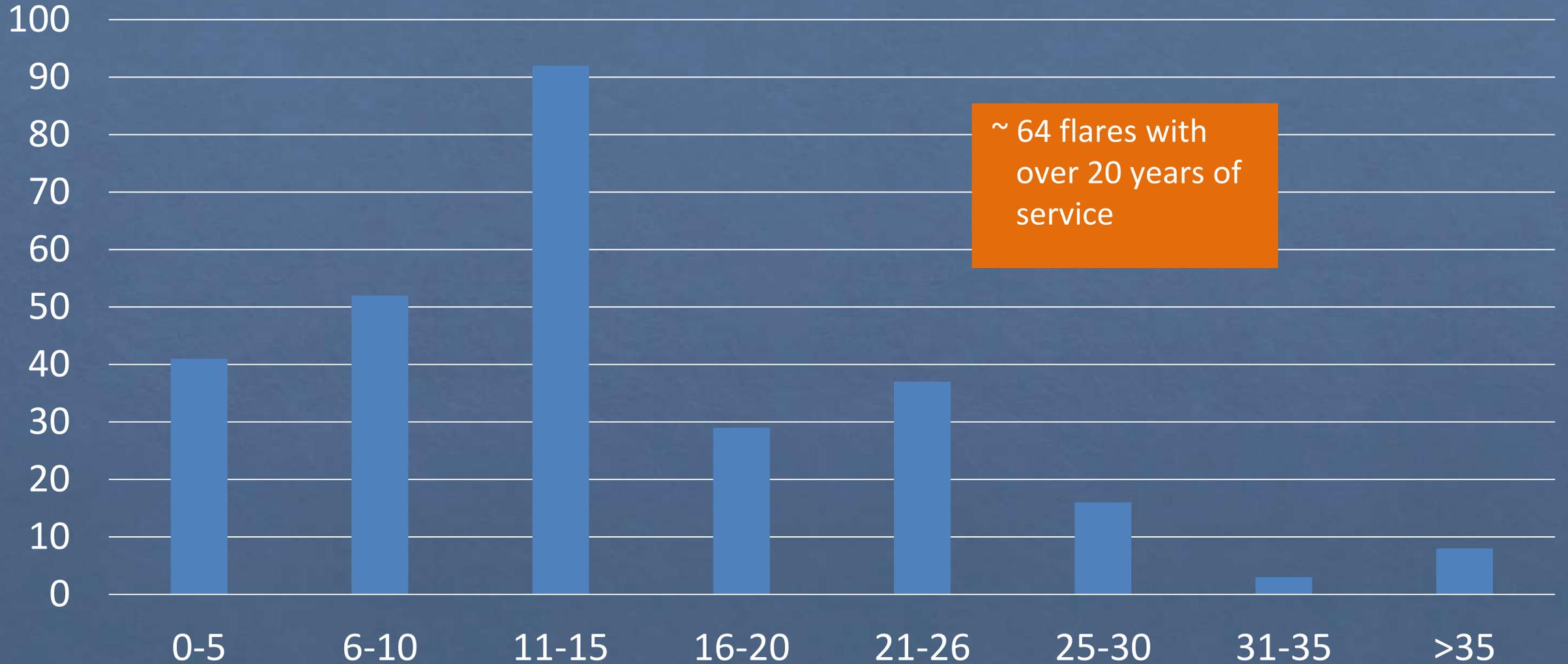
AFFECTED UNIVERSE*

Total Flares	277
Meeting Proposed Limits	15
Low-Use	17
Low-Emitting	93
At closed landfills generating less than 1,000 MMscf/year	20
Meeting 85% Beneficial Use in 2019	17
≥20 years of service not meeting proposed allowances:	
2019	23
2020	3
2021	4
2022	1
2023	2

Additional flares per year

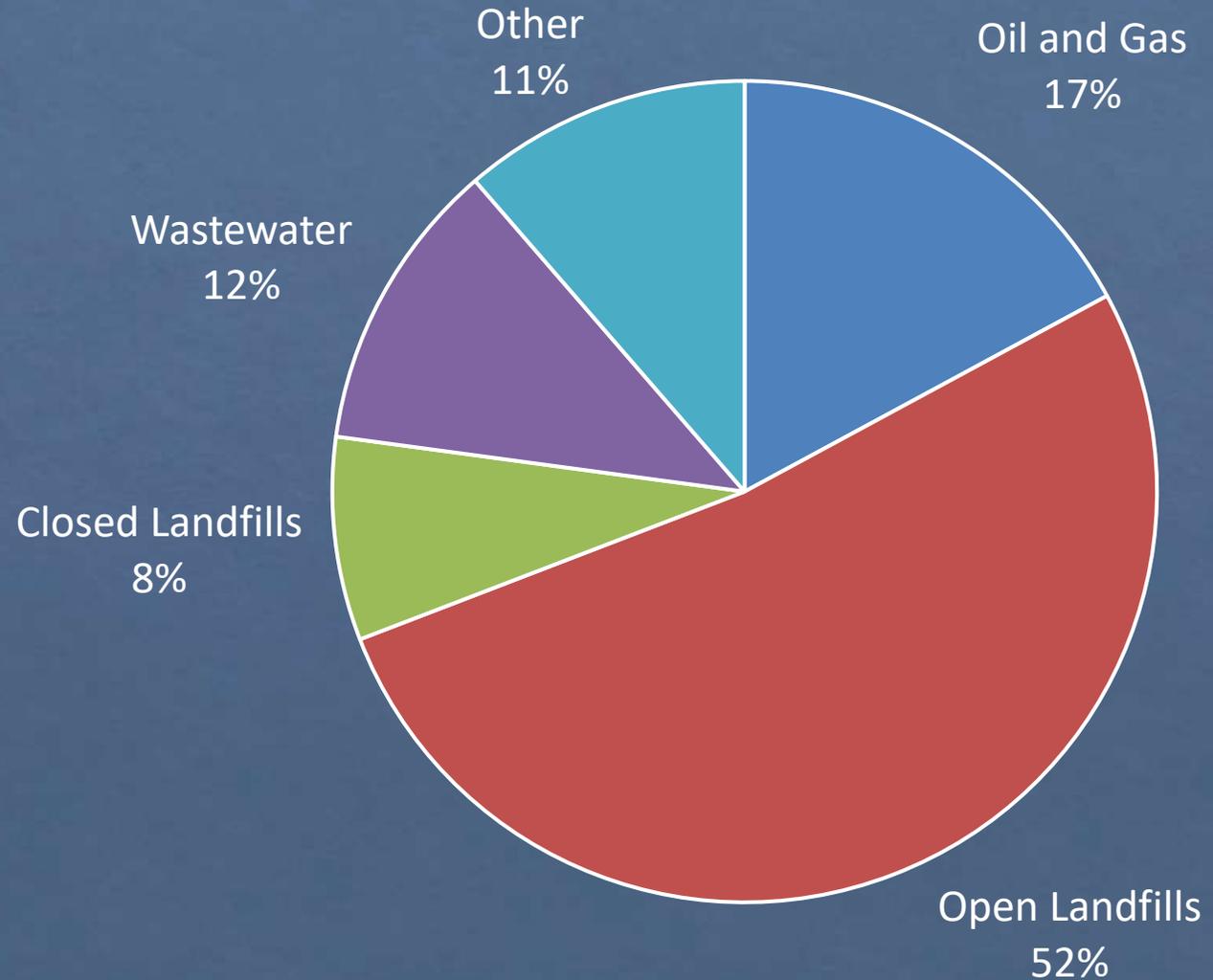
* Note: Data is draft, staff continues to compile and refine data, especially regarding Beneficial Use estimates.

AGE OF EXISTING FLARES IN 2019



2016 EMISSION INVENTORY

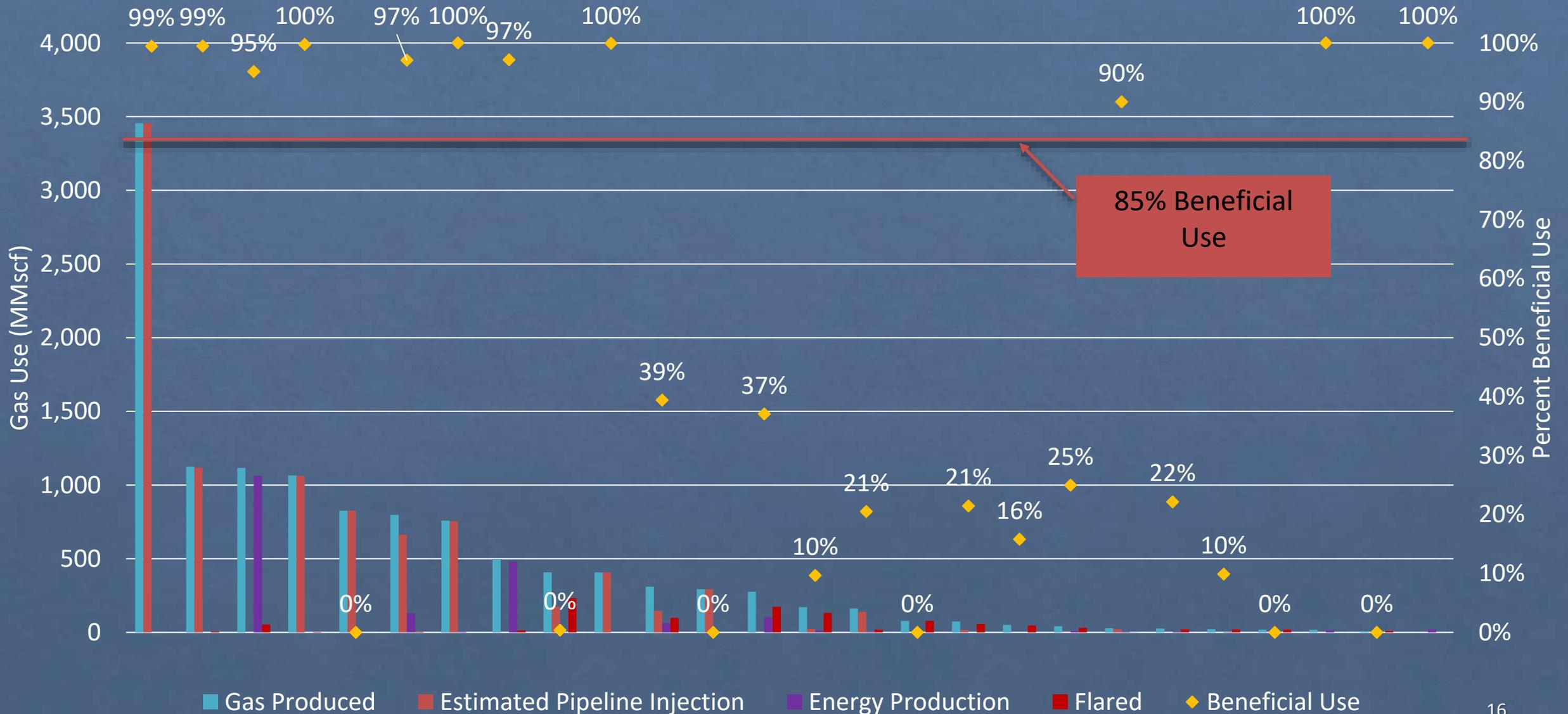
Emissions Inventory	0.85 tpd
Potential Emission Reductions by 2023	0.1 tpd



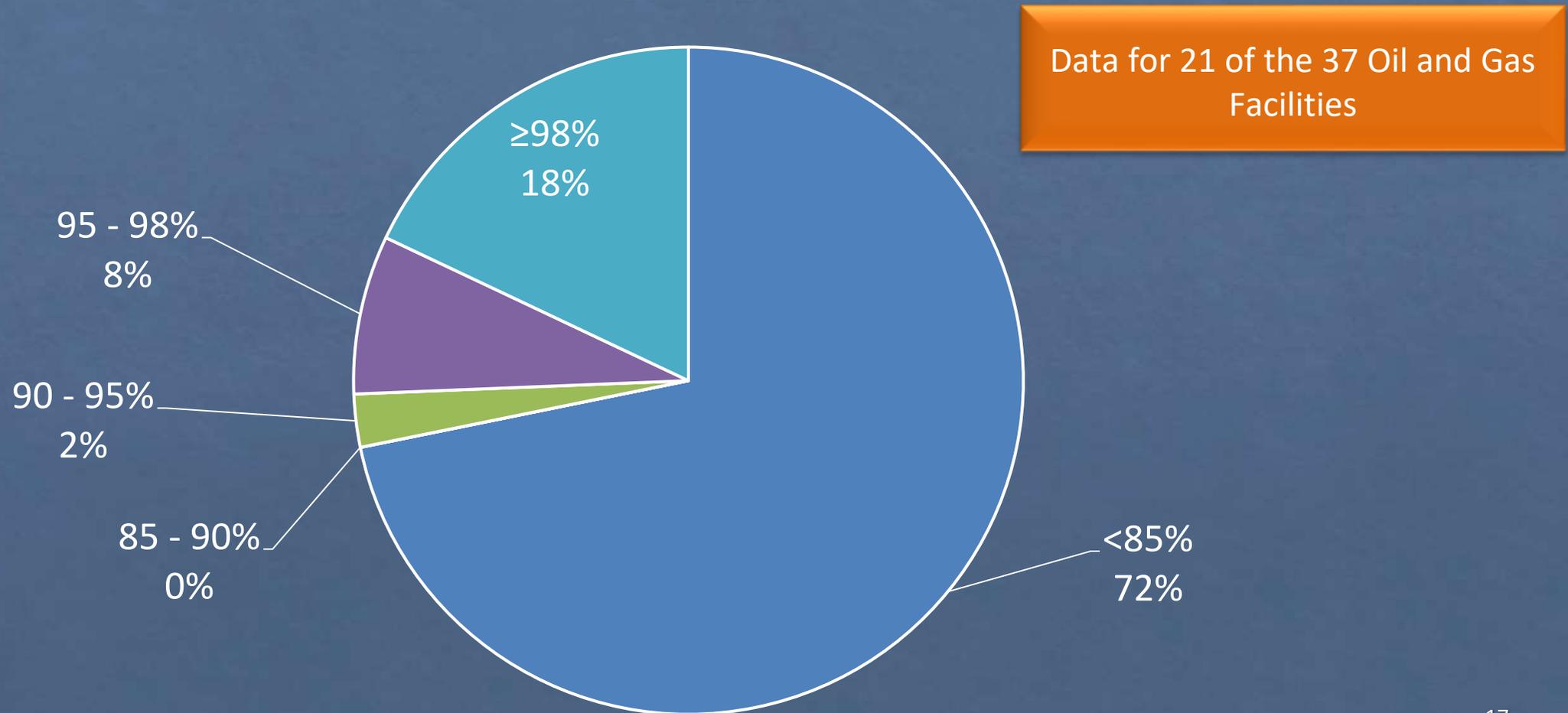
BENEFICIAL USE ESTIMATES

- Source of data
 - Annual Emission Reporting (AER)
 - Volume of gas flared
 - Volume of gas used for energy production (gas used in turbine, engine, etc.)
 - *Data limited to facilities that emit more than 4 tons per year of a criteria pollutant*
 - Oil and Gas Industry
 - Volume of gas generated estimated from DOGGR website
 - Assume volume of gas not flared or used for energy production was injected in pipeline
 - Challenging to match data from DOGGR to specific SCAQMD facilities
 - Landfills
 - Volume of gas generated from Rule 1150.1 Annual Reports
 - Wastewater Treatment
 - Assumed all gas used at facility accounted for in AER reports

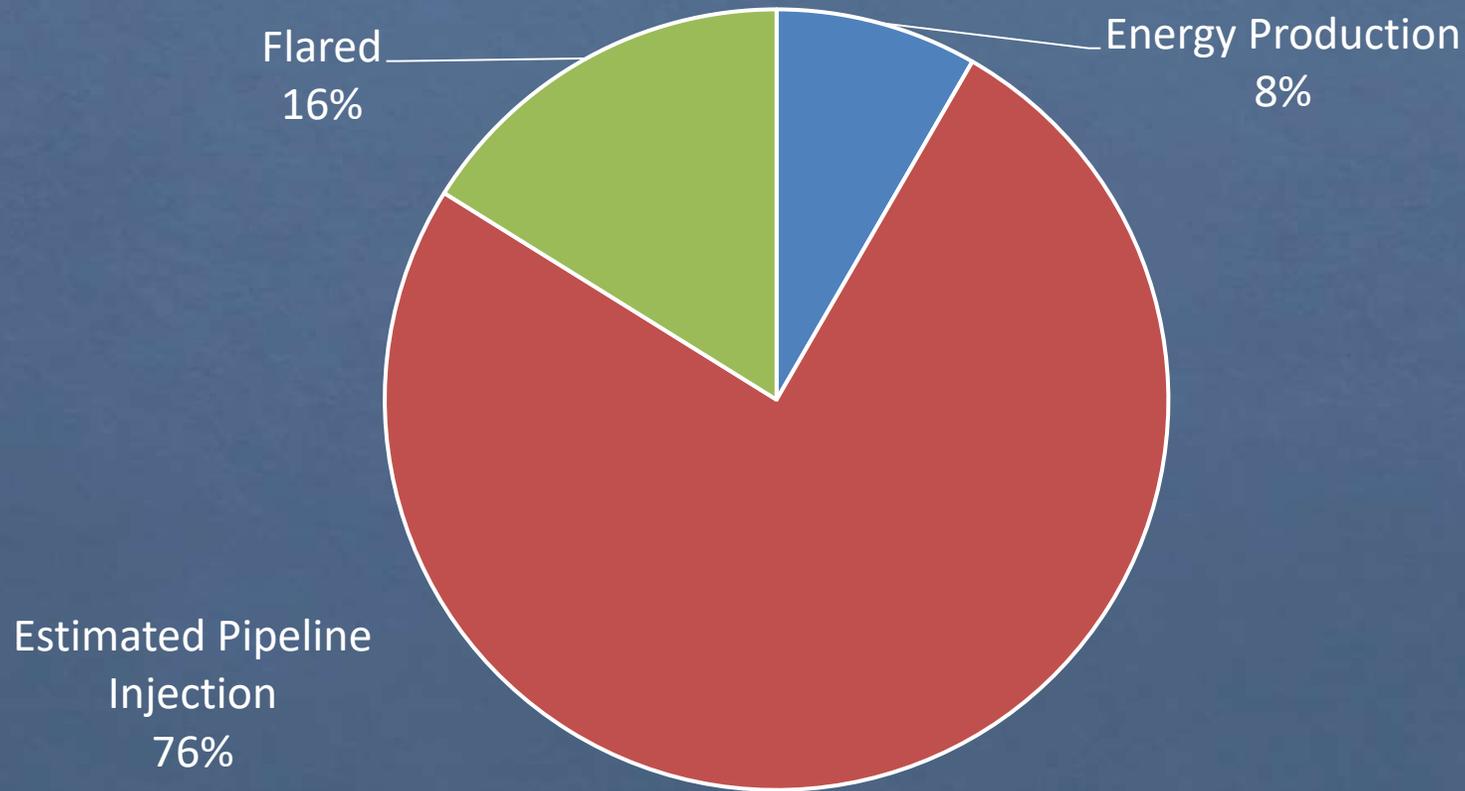
SUMMARY OF OIL AND GAS HANDLING



BENEFICIAL USE PERCENTAGES AT OIL AND GAS FACILITIES

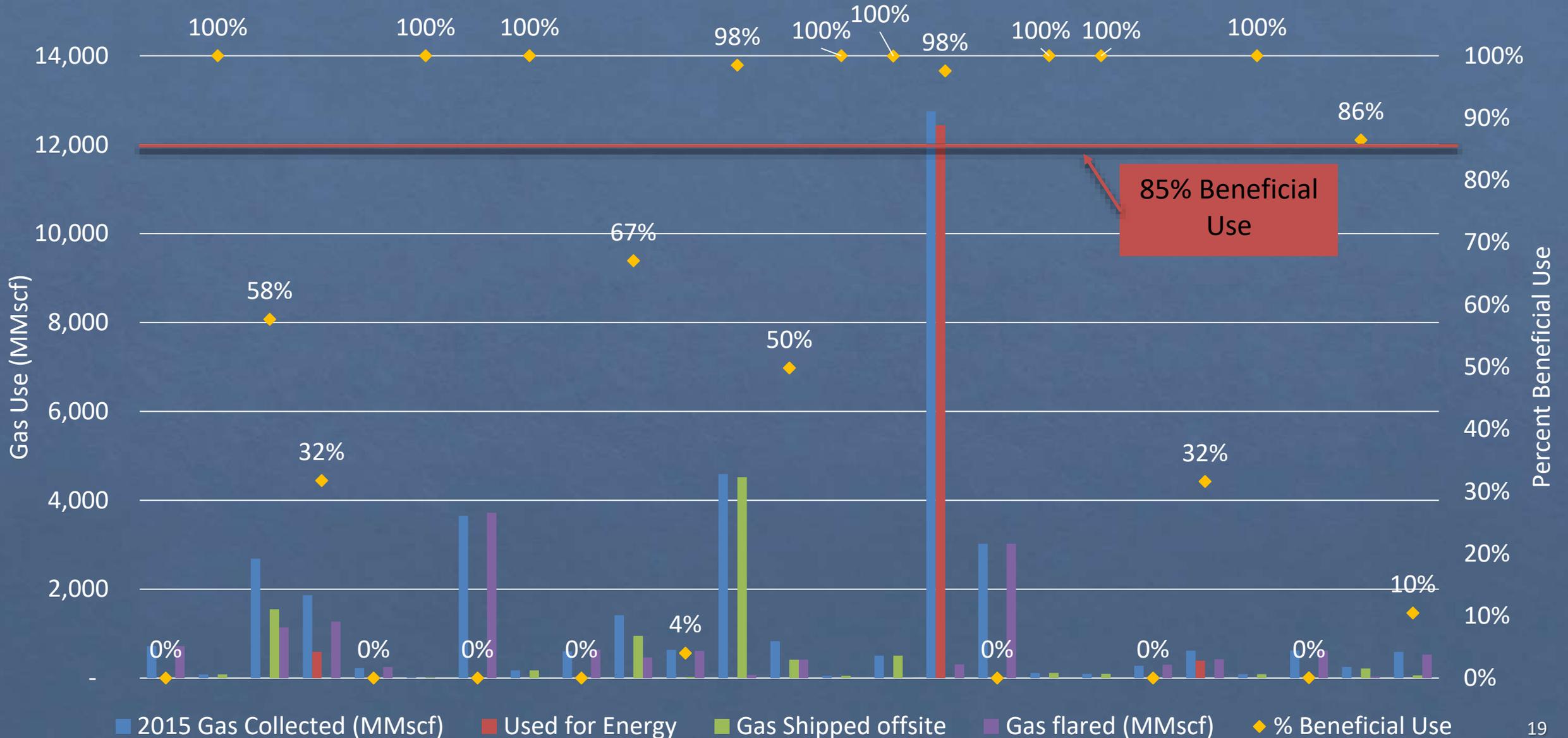


SUMMARY OF OIL AND GAS INDUSTRY USE OF GAS PRODUCED

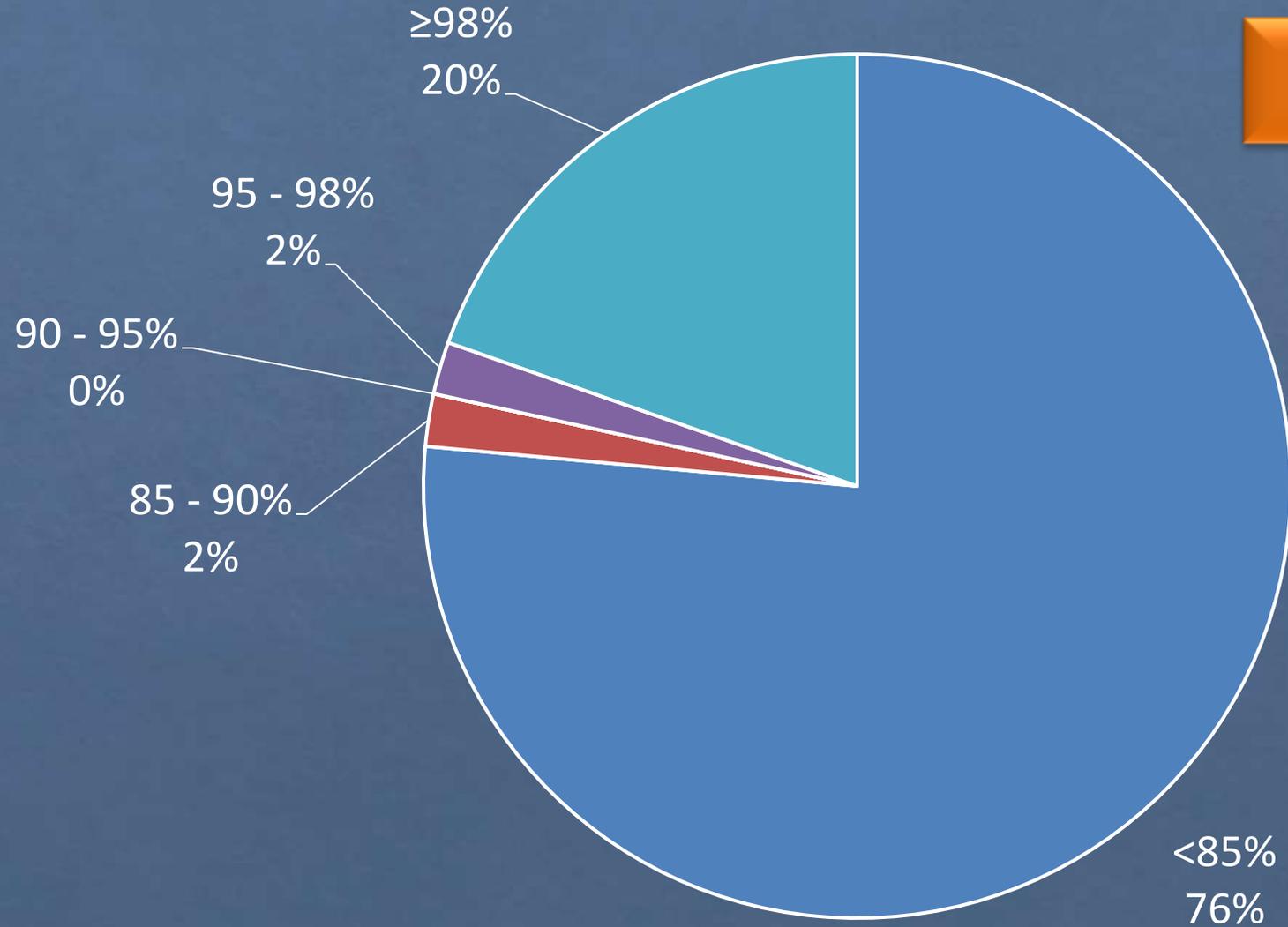


Estimated Total Gas Produced:
12,000 MMBtu

SUMMARY OF LANDFILL GAS HANDLING

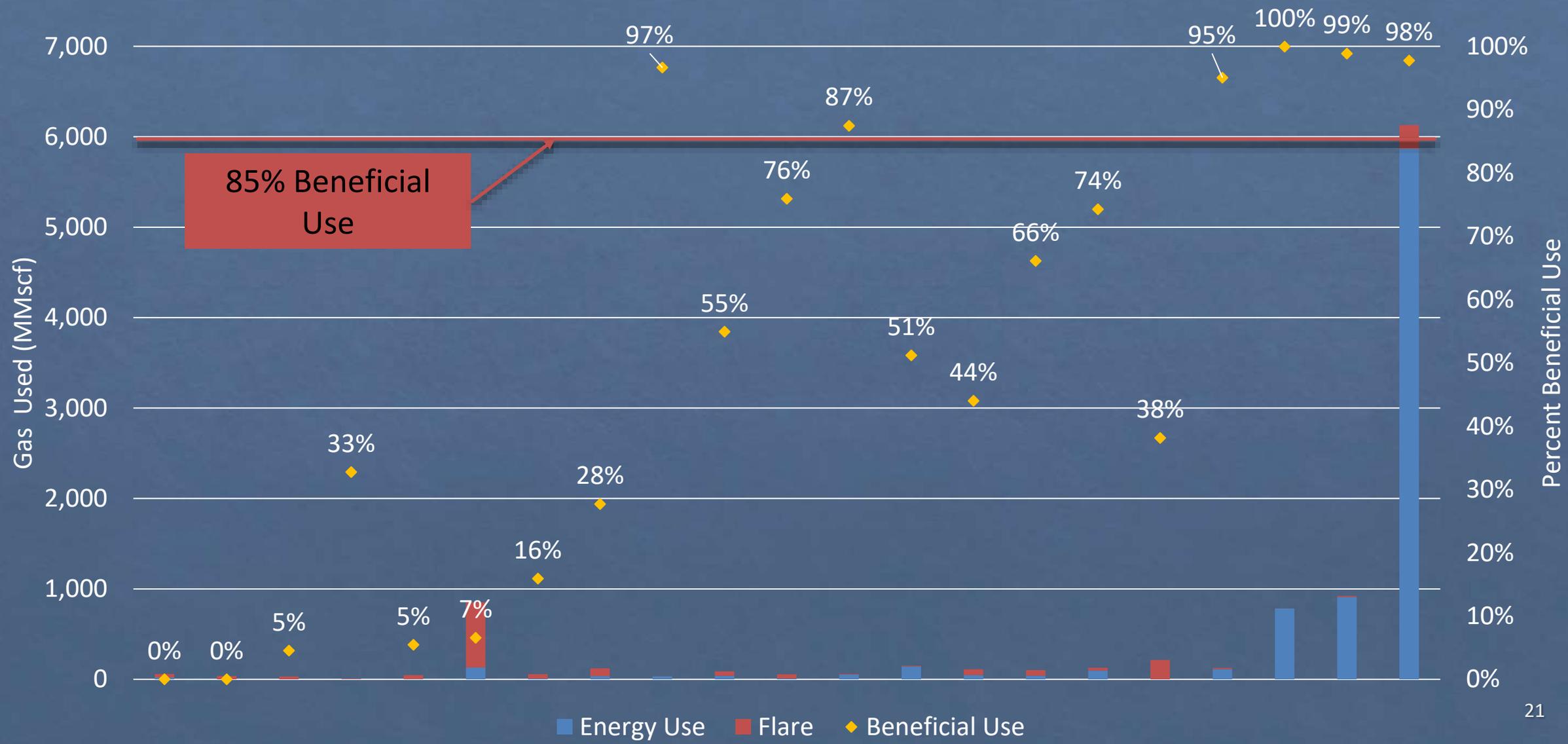


BENEFICIAL USE PERCENTAGES AT LANDFILLS

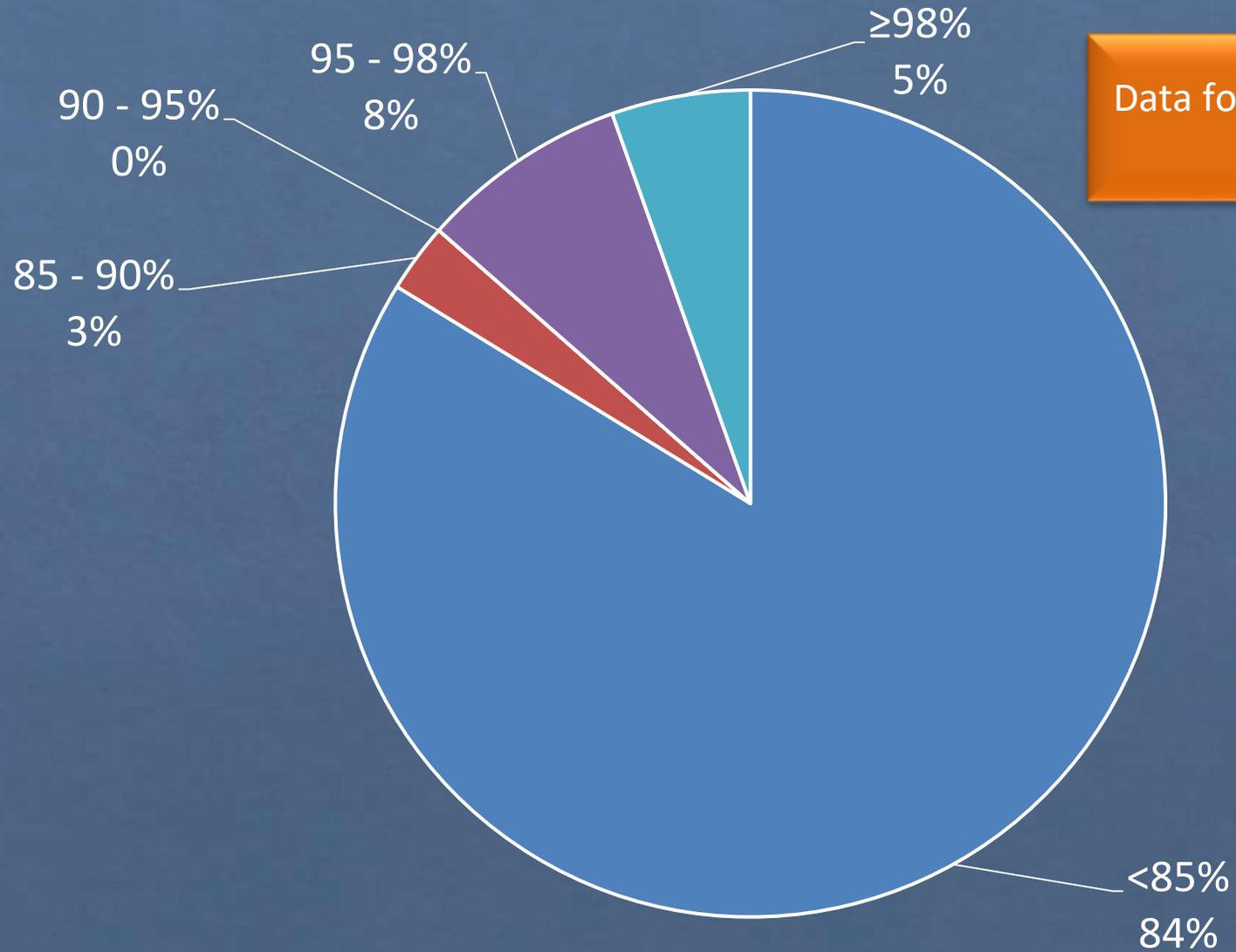


Data for 20 of the 51 Landfills

SUMMARY OF WASTEWATER TREATMENT PLANT GAS HANDLING



BENEFICIAL USE PERCENTAGES AT WASTEWATER TREATMENT PLANTS



Data for 21 of the 29 Wastewater Treatment Plants

FACILITIES CURRENTLY MEETING PROPOSED BENEFICIAL USE REQUIREMENTS BY INDUSTRY

Industry	Total Facilities	Facilities Meeting Proposed Beneficial Use Percentages			
		85 – 90%	90 – 95%	95 – 98%	≥98%
Oil and Gas	37	0	1	3	7
Landfills	51	1	0	1	10
Wastewater Treatment	29	1	0	3	2

COST EFFECTIVE ESTIMATES

- **2016 Air Quality Management Plan - Programmatic Evaluation**
 - Estimated cost effectiveness at less than \$20,000/ton
 - Assuming all flares would be replaced ~250 flares
 - Higher emission inventory ~2.4 tons/day
 - Higher emission reductions ~ 1.3 tons/day
- **Current Evaluation – Actual Facility Data**
 - Replacement of flares with 20 years service life if do not meet:
 - Low-use
 - Low-emitting
 - Beneficial Use Targets

COST EFFECTIVE ESTIMATES

Assumptions

- Capital Costs
 - 40 MMBtu - \$360,000
 - 17 MMBtu - \$225,000
 - 1.7 MMBtu - \$180,000
- Installation cost
 - 5 - 15% of the capital cost
- Service Life
 - 25 years
- Annual Maintenance Cost
 - \$30,000 at 80% - full capacity
 - \$15,000 - 19,000 at 50% - 60% capacity
 - \$10,000 at 20% capacity
- Cost information obtained from flare manufacturer and end user feedback

COST EFFECTIVE ESTIMATES

Oil and Gas

- 1 flare replacement/Beneficial Use by 2023
- Low-emitting flare ~500 lbs NOx/year
- Emission reduction ~0.0003 tons/day
- >\$100,000/ton assuming flare replaced with 1.7 MMBtu flare
- Future increase in price of oil could drive up emissions

Landfills

- 13 flare replacements/Beneficial Use by 2023
- Emission Reduction ~ 0.029 tons/day
- ~\$40,000/ton*

Wastewater Treatment

- 13 flare replacements/Beneficial Use by 2023
- Emission Reduction ~ 0.034 tons/day
- ~\$40,000/ton*

Other Flaring

- 6 flare replacements
- Emission Reductions ~ 0.008 tons/day
- ~\$30,000/ton assuming flare replaced with 1.7 MMBtu flare

Overall Cost Effectiveness*:
\$45,000/ton

* Assumes all flares replaced with 40 MMBtu flare, 15% installation, full capacity annual maintenance costs

COMPLIANCE PATHWAYS

Scenario One



Table 1 Emission Limits

Flare Categories	lb/MMBtu		
	NOx	VOC	CO
Biogas	0.025	0.038	0.06
Process Gas	0.018	0.008	0.06
Other Flare Gas*	0.025	0.038	0.06



Scenario Two



Scenario Three

Existing Flare

19 Year Service Life



Comply with Table 1 Emission Limits

Effective following September

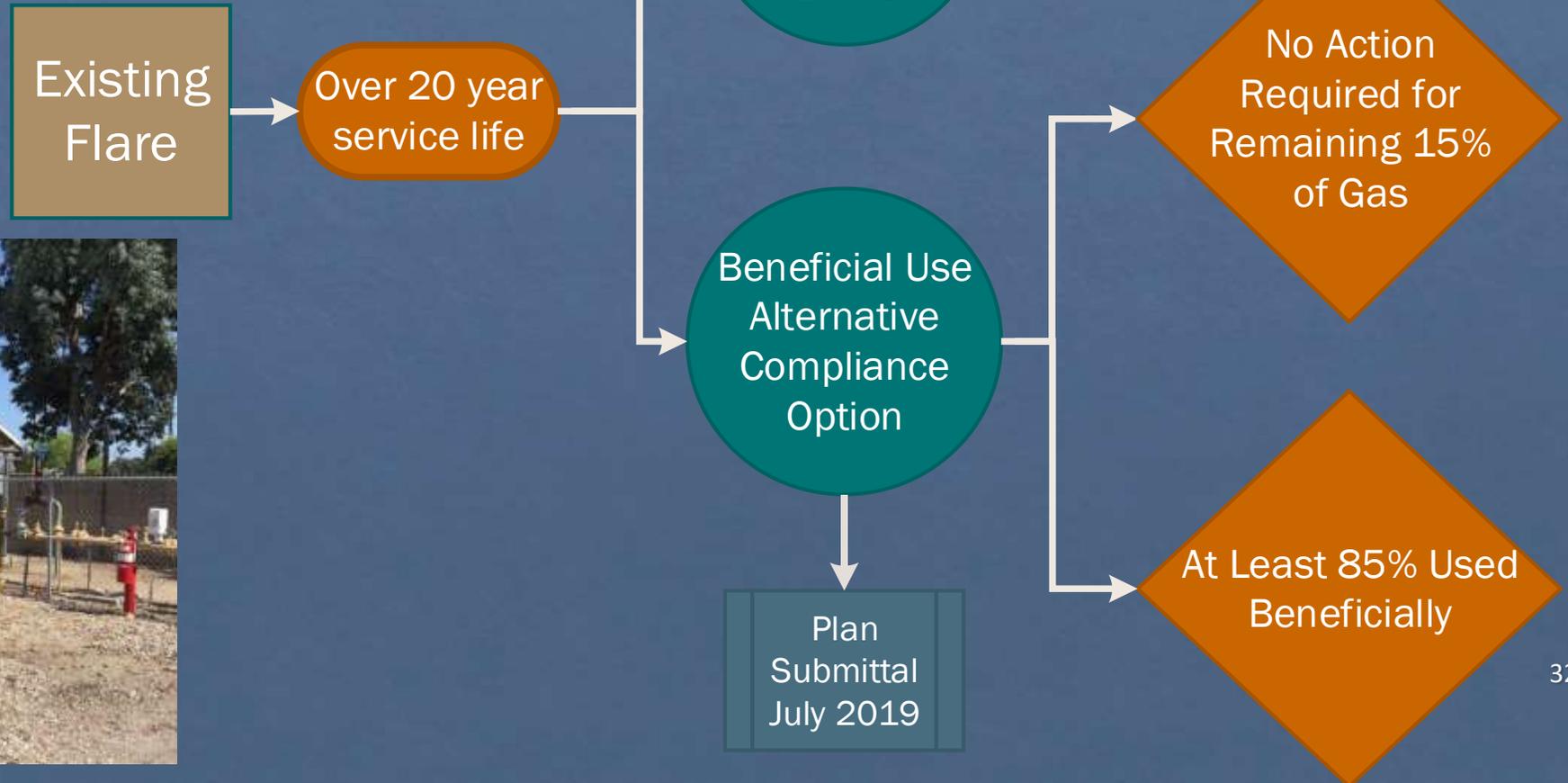
Beneficial Use Alternative Compliance Option Plan

Plan Submittal following July

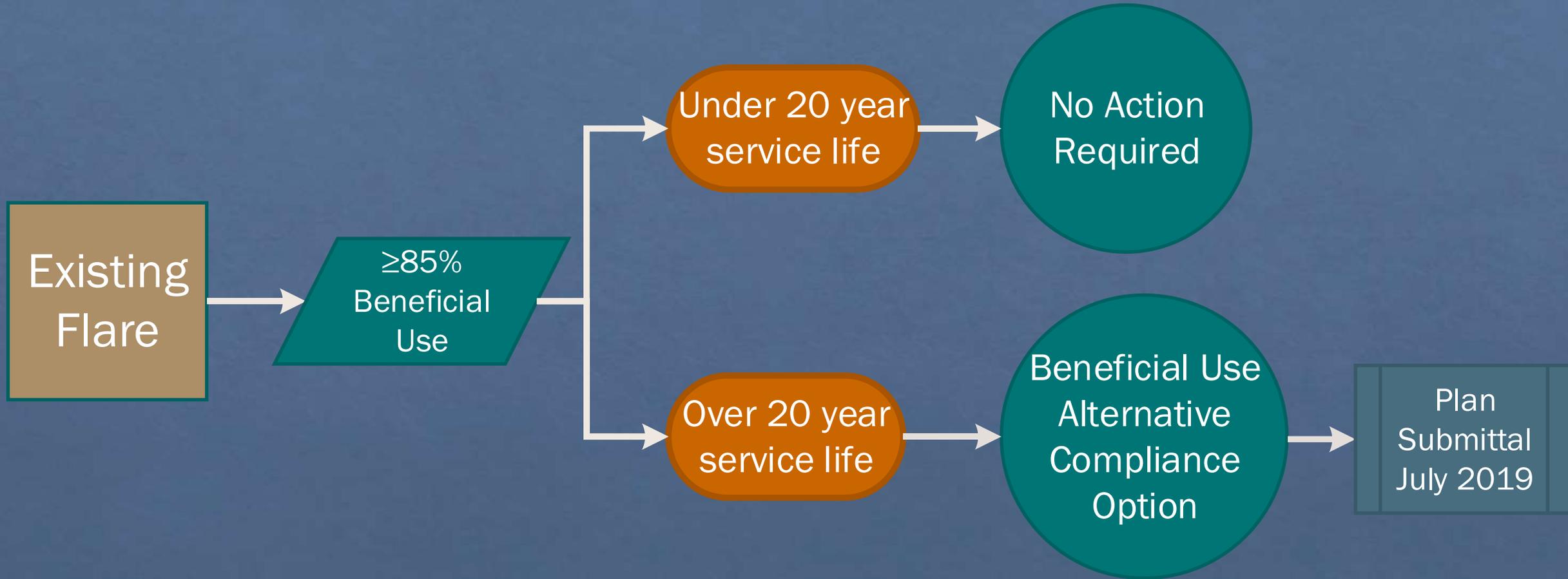


Scenario Four

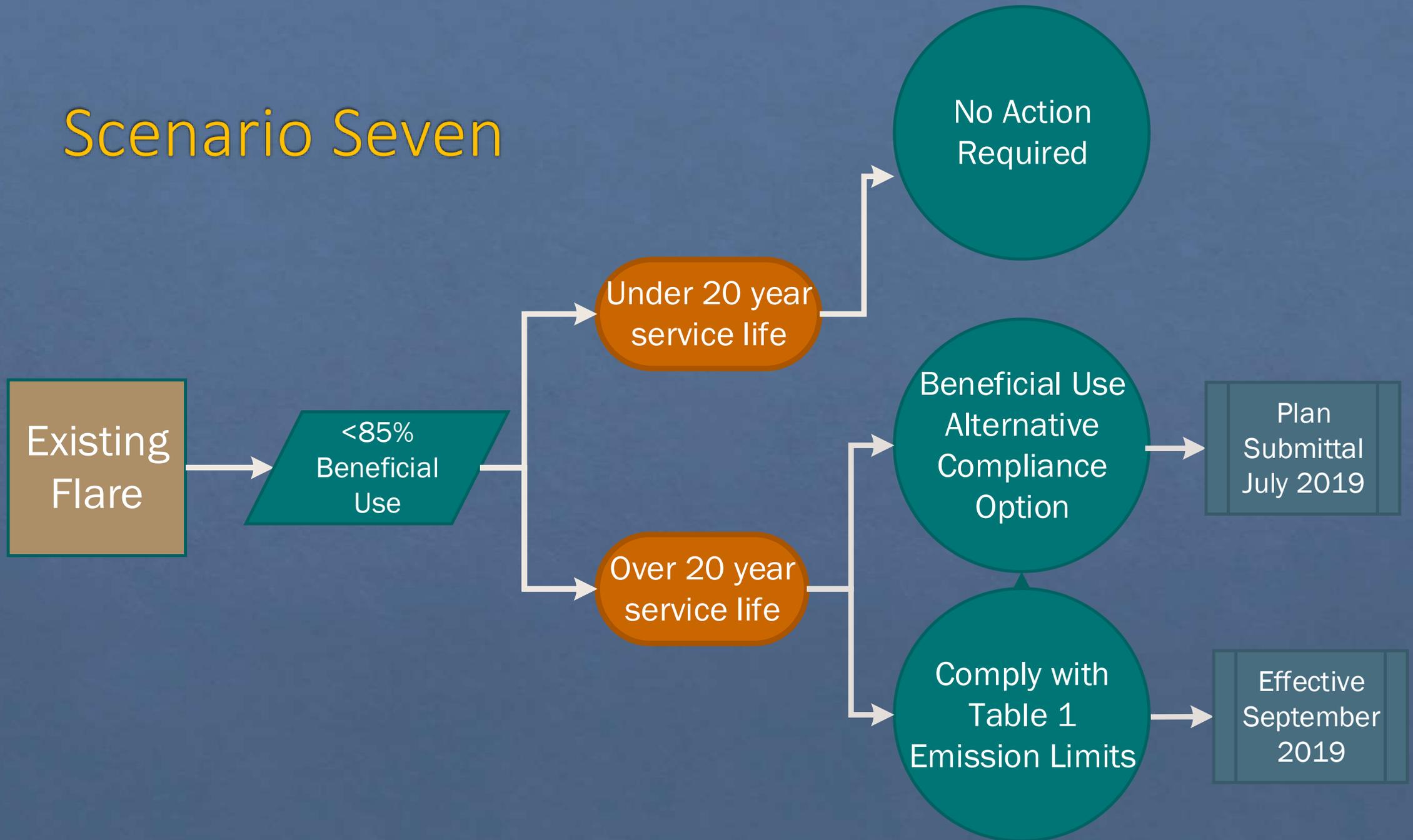
Scenario Five



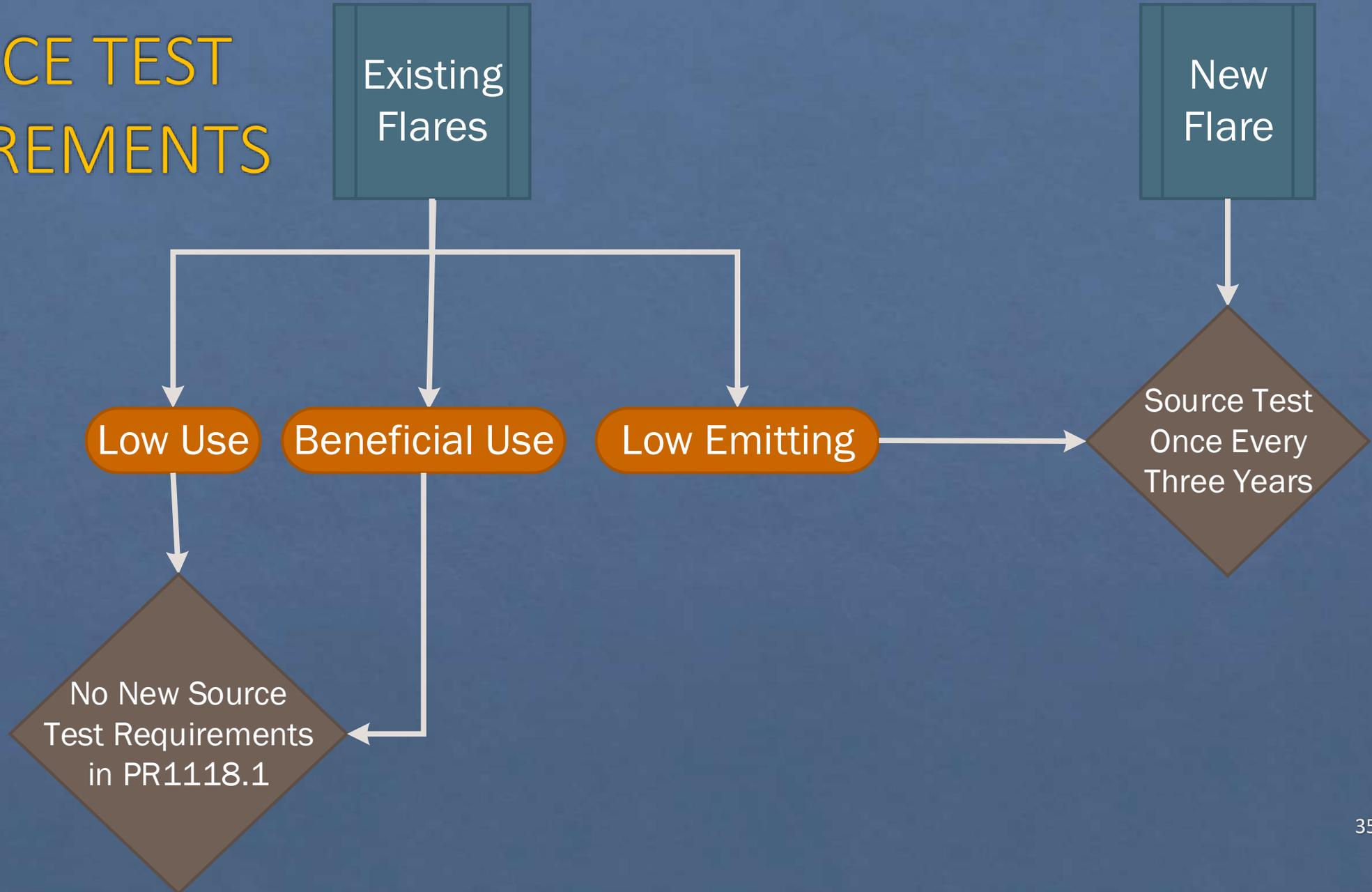
Scenario Six



Scenario Seven



SOURCE TEST REQUIREMENTS



NEXT STEPS

- Public Hearing delayed until July
- Preliminary draft staff report will be released mid-April
- Staff welcomes further comments, meetings, and site visits



CONTACT INFORMATION



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