AIR PERMITTING FOR THERMAL-BASED WASTE CONVERSION TECHNOLOGY IN THE SOUTH COAST AIR BASIN

Michael Rogozen, D.Env.
UltraSystems Environmental Inc.

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Topics for Today

- **AIR PERMITTING**
  - ✓ **Rules**
  - ✓ **Obtaining Permits**
- **ENVIRONMENTAL DOCUMENTATION**
  - ✓ **State of California (CEQA)**
  - ✓ **Federal (NEPA)**

Pollutants of Concern

"CRITERIA" POLLUTANTS AND PRECURSORS:

- Ozone (O_3)
- Nitrogen Dioxide (NO_2)
- Carbon Monoxide (CO)
- Respirable Particulate Matter (PM_{10})
- Fine Particulate Matter ($PM_{2.5}$)
- Volatile Organic Compounds (VOC)

BASIC SMOG REACTION:

VOC + NO_X +  $\rightarrow O_3$

Pollutants of Concern

LOCALLY IMPORTANT AIR TOXICS:

- Diesel Particulate Matter (DPM)*
- Benzene
- 1,3-Butadiene
- Carbonyls (such as Formaldehyde)
- Heavy metals (lead, chromium, cadmium)

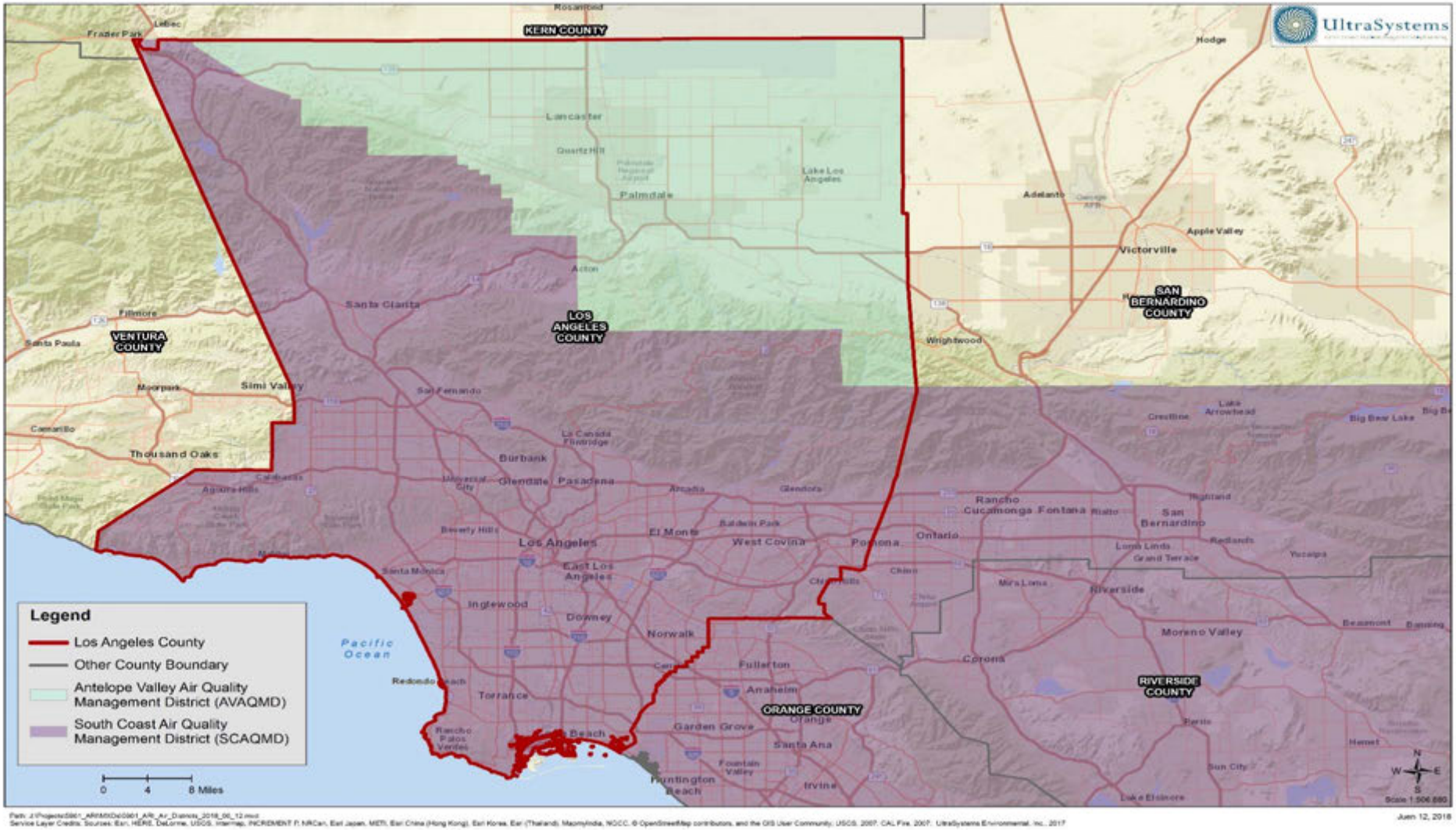
* Not a concern for WT processes.

Pollutants of Concern

GREENHOUSE GASES:

- Carbon Dioxide (CO_2)
- Methane (CH_4)
- Nitrous Oxide (N_2O)
- Many refrigerants
- Sulfur Hexafluoride (SF_6)

Air Quality Management Districts for LA County



South Coast Air Basin Attainment Status

Pollutants	Federal Classification	State Classification
Ozone (O_3)	Non-Attainment (Extreme)	Non-Attainment
Particulate Matter (PM_{10})	Maintenance	Non-Attainment
Fine Particulate Matter ($PM_{2.5}$)	Non-Attainment	Non-Attainment
Carbon Monoxide (CO)	Maintenance	Attainment
Nitrogen Dioxide (NO_2)	Maintenance	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment

Some Relevant SCAQMD Rules

Rule	Name of Rule	What it Does	Comments
431.1	Sulfur Content of Gaseous Fuels	Limits fuel sulfur content to 40 ppmv	For CT-derived fuels, applies if used onsite or sold offsite as fuel
475	Electric Power Generating Equipment	For max. rating > 10 net MW; limits mass and concentration in emissions	Applies to all pollutants combined
1110.2	Emissions from Gaseous-land Liquid-Fueled Engines	Limits emissions of NO_x, VOC and CO from engines > 50 bhp	Applies to landfill and digester gas but not to CT engines

New Source Performance Standards

- Federal Clean Air Act § 111
- 97 Categories of emission sources (CT = 6, maybe)
- Apply mainly to relatively large emission sources
- Only for new or modified sources
- Enforcement delegated to SCAQMD but EPA can step in

How § 111 Can Affect a Project

- Many additional permit conditions
- More stringent emission limits (usually)
- Much more "paperwork"
- Can make an otherwise exempt facility have to obtain a Title V permit (*discussed later*)

Possibly Relevant NSPS

NSPS Subpart	Emission Source Type	How to Be Ineligible
Da	Electric Utility Steam Generating Units	Produce < MW and/or don't sell electricity
Dc	Small Industrial-Commercial-Institutional Steam Generating Units	Keep heat input < MMBtu/hr
E	Incinerators	Prove that device is not an incinerator
AAAA	Small Municipal Waste Combustion Units	Do not combust municipal waste
CCCC	Commercial and Industrial Solid Waste Incineration Units	Prove that device is not an incinerator
EEEE	Other Solid Waste Incineration Units	Gasification and combustion in separate devices; APC

SCAQMD Permits

- Required for all emission sources unless specifically exempted (**Rule 219**)
- Also required for all **control devices**
- **Permit to construct (PTC)** – Don't build anything without one
- **Emissions testing** sometimes required
- **Permit to operate (PTO)** – Renewed annually + **Permitted emissions fees**

Application for Permit to Construct

- Fill out standard forms
- Supply supporting information
- Supply regulatory analysis (optional but do it!)
- Pay fees with application and maybe some more later on (~$31K for hypothetical facility)

A Little Bit More About Getting Permits

Fees = Base fee + hourly fee for complex work + fees for additional required analyses

Base fee depends upon equipment type

Discount for duplicate identical equipment

Pay 50% more for “expedited processing” (refundable if not actually expedited)

Make sure that application is “complete.”

Some Advice

- **Meet with permit engineer in advance**
- Define **permit units** (highly recommended)
- See if engineer has own forms, procedures, etc.
- Do Rule 1401 (air toxics) screening analysis
- Get on same page with engineer about submittal requirements

New Source Review - A

- Purpose: no net increase in nonattainment pollutants or their precursors
- All sources of these pollutants must use best available control technology (BACT)
- Major sources must have lowest achievable emission rate (LAER)
- Some thermal based CT processes may qualify as major sources (e.g. 10 tons/yr of NO_x)

New Source Review - B

- For certain emission levels, NO_X, CO and PM_{10} dispersion modeling required (to see if violation of ambient standards will occur)
- If VOC, NO_X, SO_X, or PM_{10} > 4 tons/yr, then offsets are required
- A facility may generate credits for offsets by retiring some of its own polluting equipment
- A facility can also buy someone else's credits.

Cost of Emissions Offsets

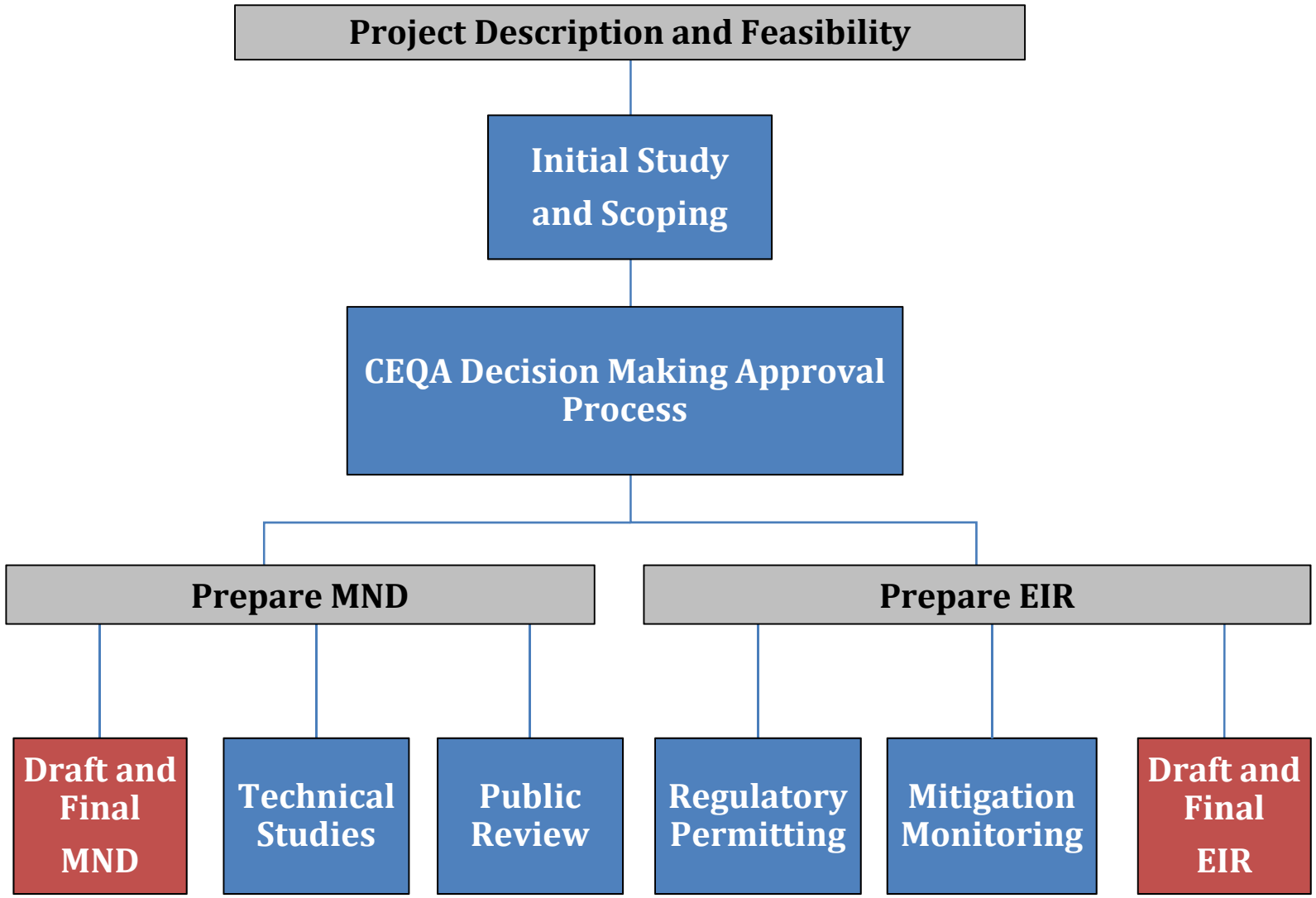
- SCAQMD keeps records of all credits available in the District, and of all transactions
- If VOC, NO_X, SO_X, or PM_{10} > 4 tons/yr, then offsets are required
- Some recent average sale prices:

Year	2015	2016
ROG	$21,287	$18,091
NO_x	$91,236	None
PM_{10}	$552,146	$546,011

Federal Title V Permit

- Required if facility-wide criteria pollutant or air toxics emissions exceed certain levels
- Also required if NSPS apply, even if emissions are below thresholds
- Lists all relevant permit conditions and regulatory requirements in one document
- Applies to new and existing sources.
- Public and EPA review
- Annual fees must be paid (~$50/ton of emissions)

CEQA - Approach



CEQA Initial Study Checklist Topics

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Tribal Cultural Resources
- Utilities and Service Systems
- Mandatory Findings of Significance