

**SAN JOAQUIN VALLEY UNIFIED  
AIR POLLUTION CONTROL DISTRICT**

**DATE:** June 13, 2012

**TO:** Permit Services Staff

**FROM:** Arnaud Marjollet, Permit Services Manager  
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**SUBJECT:** Small Project Analysis Levels for Ambient Air Quality Analysis –  
Combustion Exhaust Emissions

This FYI describes the process used to establish small project analysis levels (SPAL) for determining if short-term, on-site combustion exhaust emissions are likely to result in an exceedance of an ambient air quality standard.

**Applicability**

The procedures described in this FYI are to be used to establish SPAL levels for projects involving short-term, onsite combustion exhaust emissions. For example, exhaust emissions from construction of residential and commercial development projects, or exhaust emissions from industrial projects such as oil well drilling and oil well rework projects.

Projects below the applicable SPAL value would be concluded to not result in an exceedance of an ambient air quality standard and thus would not require preparation of an ambient air quality analysis (AAQA). Projects above an applicable SPAL level would require a more refined review and potentially preparation of an AAQA.

**Background**

The California Environmental Quality Act (CEQA) requires cities, counties, and other public agencies to assess the significance of all environmental impacts of any discretionary decision made by the agency. The District *Guidance for Assessing and Mitigating Air Quality Impacts on Air Quality* (GAMAQI) recommends that an ambient air quality analysis (AAQA) be conducted if, after mitigation, on-site construction or operational emissions of any criteria pollutant would exceed 100 lb/day or any applicable threshold of significance. To streamline the process of assessing significance of criteria pollutant emissions from commonly encountered projects, the District has developed the screening tool, Small Project Analysis Level (SPAL). Using project type and size, the District has pre-quantified emissions and determined a size below which it is reasonable to conclude that a project would not have an adverse impact on air quality and thus, an AAQA is not required.

## Procedure Estimating Combustion Exhaust Emissions

CalEEMod was used to calculate combustion exhaust emissions resulting from construction of a 250 dwelling unit residential development project. A 250 dwelling unit development project was chosen to provide a construction period of at least 12 months. Construction exhaust emissions were calculated using all CalEEMod default assumptions for construction equipment type, horsepower ratings, total pieces of construction equipment, hours of operation, and load factors. CalEEMod default activities included site development, vertical construction, paving and architectural coatings. Offsite construction emissions, such as emissions from vendor and worker trips were not included in the analysis.

NOx is the predominant combustion exhaust pollutant and would be the first pollutant to exceed the 100 lb/day trigger for conducting an AAQA. Therefore, SPAL levels are based on NOx emissions. Construction activities and associated NOx emissions are presented in Table 1.

Table 1: NOx Emissions for Construction of 250 Dwelling Units

EquipmentType	Unit amount	Hours/day	Horsepower	Load Factor	Total Days	Equipment Hours	hp-hr	Total NOx Tons/yr
Excavators	2	8	157	0.57	30	480	75,360	1.56
Graders	1	8	162	0.61	30	240	38,880	
Dozers	1	8	358	0.59	30	240	85,920	
Scrapers	2	8	356	0.72	30	480	170,880	
Tractors	2	8	75	0.55	30	480	36,000	
Cranes	1	7	208	0.43	232	1,624	337,792	4.33
Forklifts	3	8	149	0.3	232	5,568	829,632	
Generators	1	8	84	0.74	232	1,856	155,904	
Tractors	3	7	75	0.55	232	4,872	365,400	
Welders	1	8	46	0.45	232	1,856	85,376	
Pavers	2	8	89	0.62	11	176	15,664	0.19
Paving Equipment	2	8	82	0.53	11	176	14,432	
Rollers	2	8	84	0.56	11	176	14,784	
Air Compressor	1	6	78	0.48	24	144	11,232	0.04
							2,237,256	6.12
Determine the amount of horsepower hours required to generate 100 lbs NOx per day								
ton-NOx/yr	lb-NOx/hp-hr	lb-NOx	hp-hr					
6.12	0.0054709877	100	18,278					

## Procedure Establishing SPAL Level for Combustion Exhaust Emissions

Horsepower hours by equipment type were summed, yielding total horsepower hours for constructing the project. NOx emissions by construction activity were summed, yielding total tons of emitted NOx. Total tons NOx emissions were converted into total pounds of NOx. Total pounds of NOx divided by total horsepower hours yields an emissions factor of 0.0055 lb-NOx/hp-hr.

Calculation:

$$0.005 \text{ lb-NOx} / 1 \text{ hp-hr} = 100 \text{ lb-NOx} / X \text{ hp-hr}$$

Solve for X;

$$X = 18,278 \text{ hp-hr}$$

$$\text{SPAL Level} = 18,278 \text{ hp-hr}$$

Projects in which total combined hp-hr hours for all equipment operated on site, within a 24-hour period, is less than 18,278 hp-hr are determined to not require an ambient air quality analysis.

**Ambient Air Quality Analysis Small Project Analysis Level (SPAL) by Project Type**

<b>Land Use Category</b>	<b>Project Size</b>
Residential Developments	All projects are less than AAQA threshold
Oil Field Well Drilling and Rework	All projects are less than AAQA threshold