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To:	County of San Diego Department of Planning and Land Use	**From:**	Valorie Thompson
Re:	Otay Crossings Commerce Park Revised Tentative Map Air Quality and Global Climate Change Impacts	**Date:**	January 9, 2013

This technical memorandum addresses Air Quality and Global Climate Change impacts associated with revisions to the Otay Crossings Commerce Park Project Tentative Map.

Based on the revisions to the approved Tentative Map (TM 5405 RPL) and Preliminary Grading Plan for the 311.5-acre Otay Crossings Commerce Park, the revised TM would subdivide the 311.5-acre property into 44 industrial lots and 3 open space areas. This change would result in 12 fewer industrial lots from the approved TM. The 47 lots would be divided and recorded in five separate units. Approximately 238.4 acres would be placed in lots (including FHWA/Caltrans/GSA ROW), while 25.4 acres would contain internal on-site public streets. The amount of area placed in open space would not change from the approved TM.

The revised TM would entail the phased grading of approximately 216 acres of the property, which would amount to approximately 50 less graded acres than the approved TM. Under the revised TM, earthwork on site would increase from 1,882,000 cubic yards of balanced cut and fill to 2,100,000 cubic yards of balanced cut and fill. Grading Phase 1, which would cover approximately 151.5 acres, would be expected to begin in 2014. Grading Phase 2, which would cover approximately 64.7 acres, would be expected to begin in 2015. As with the approved TM, there is the possibility that both grading phases could occur simultaneously with up to 40 acres of the site actively graded on any given day.

Air Quality Impacts - Construction

Air quality impacts associated with construction were evaluated in the Air Quality Technical Report[1], which was approved by the Department of Planning and Land Use (DPLU) in 2010. The analysis assumed that a maximum of 40 acres would be undergoing grading on any single day, and that grading of Phase 1 would commence in 2010. The analysis assumed that both grading phases could occur simultaneously with up to 40 acres of the site actively graded on any single day. This assumption remains the same with the revised TM, except that grading will start in 2014.

Because the analysis assumed a maximum of 40 acres could be graded in any single day, the emissions of fugitive dust would not change with adoption of the revised TM. While the amount of earthwork would increase, the significance thresholds are based on daily maximum emissions, and the

[1] Scientific Resources Associated. 2009. *Air Quality Technical Report for the Otay Crossings Commerce Park*. December 14.

daily maximum fugitive dust generation would not increase due to adoption of the revised TM because the same amount of daily grading is assumed to occur. As stated in the EIR, fugitive dust emissions would be above the significance threshold, and this impact would be significant and unmitigable.

As requested by the County, an analysis was prepared to compare the fugitive dust generated during earthmoving activities for 1.882,000 cubic yards of material versus 2,100,000 cubic yards of material. Based on information from the project construction contractor[2], earthmoving of 2,100,000 cubic yards of material would require approximately 105 days to complete, with an estimated maximum of 20,000 cubic yards of material would be moved in any single day. Earthmoving of 1,882,000 cubic yards of material would require approximately 94 days to complete, with an estimated maximum of 20,000 cubic yards of material moved in any single day. Trucks would not be used to move material; rather, material would be moved using scrapers as modeled in the EIR.

To provide a comparative calculation of emissions attributable to earthmoving activities, the CalEEMod Model was used based on the assumptions provided by the construction contractor. According to the construction contractor, watering would be used for fugitive dust suppression. It is estimated that 600,000 to 700,000 gallons per day would be used at the site during earthmoving activities, and that watering of transport routes would be continuous. Based on the site configuration, it is estimated that scrapers would travel as much as 0.15 miles on the site between cut and fill locations. Because the CalEEMod model does not allow input of the daily earthmoving, and because according to the construction contractor, daily earthmoving would be limited by the amount of equipment and equipment capacity on site, emissions were estimated using the maximum daily earthmoving of 20,000 cubic yards of material in a single day. To control fugitive dust, it is estimated by the construction contractor that 30 to 35 gallons per cubic yard of material would be used.

According to the USEPA's AP-42 document[3], watering of unpaved roads provides up to 95 percent control, depending on the moisture ratio (M) of the road. Based on the AP-42 document, the untreated moisture content of unpaved roads ranges from 0.03 percent to 13 percent. According to the SCAQMD's CEQA Air Quality Handbook[4], moisture content of wet surfaces can be as high as 50 percent. For the purpose of this analysis, it was assumed (consistent with the EIR) that vehicle speeds would be reduced to 10 mph, the silt content of the unpaved roads would be 8.5 percent based on USEPA defaults for construction sites, and the moisture content of the surface prior to application of water would be 12 percent.

Because the CalEEMod Model does not allow input of daily earthmoving, emissions were calculated based on the calculations within the CalEEMod Model, which are derived from the USEPA's AP-42 document. According to the CalEEMod Manual[5], the following equations are used to calculate (a) loading of materials; and (b) travel on unpaved surfaces:

Loading of Materials

$$EF = k\ x\ 0.0032\ x\ \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Where: k = constant (0.35 for PM_{10})

[2] Hazard Construction Company. 2012. Personal communication from William Rogers, August 8.
[3] USEPA. 2006. *AP-42, Section 13.2.2, Unpaved Roads*.
[4] SCAQMD. 1993. *CEQA Air Quality Handbook*. Appendix A9.
[5] ENVIRON. 2011. *CalEEMod User's Guide, Appendix A*. February.

U = average wind speed, 2.6 meters/second from CalEEMod default

M = moisture content of material, assumed to be 24% based on the amount of water added to the material for dust control, which is 2 times the default value of 12%.

Travel on Unpaved Surfaces

$$EF = \left[\frac{k\ x\ (s/12)^1\ x\ (S/30)^{0.5}}{(M/0.5)^{0.2}} - C\right]\ x\ \left(1 - \frac{p}{365}\right)$$

Where: k = constant (1.5 for PM_{10})

s = silt content of unpaved roads, assumed to be 8.5%

S = speed on unpaved roads, assumed to be 10 mph

M = moisture content of unpaved roads, assumed to be 12%

C = emission factor for 1980s vehicle fleet exhaust, brake wear, and tier wear, 0.00047

P = number of days with at least 0.254 mm of precipitation (per CalEEMod guidance, assumed to be zero for daily emissions)

Based on the assumptions discussed above, movement of 20,000 cubic yards of material per day would result in emissions of 17.45 lbs/day of PM_{10}.

Likewise, under the scenario in which 1,882,000 cubic yards of earthmoving would occur, a total of 20,000 cubic yards of material would be moved daily. Emissions would be calculated in the same manner as described above, and emission estimates would be 17.45 lbs/day of PM_{10}. Thus, because the amount of earthmoving on a daily basis would be unchanged with the revised TM, the emissions would be unchanged with the revised TM. Emissions from heavy construction equipment, truck trips, and worker vehicles were estimated in the Air Quality Technical Report based on the assumption that construction would commence in 2010. Emission factors for heavy construction equipment, trucks, and worker vehicles decrease with time due to the implementation of more stringent emission standards and the phase-out of older equipment and vehicles. The revised TM would not require additional equipment or vehicles because the maximum daily equipment and vehicle use would be unchanged.

A Technical Memorandum[6] was prepared at the DPLU's request to evaluate emission reductions that would be realized through the use of certified and controlled equipment. This measure was included in the analysis as required by the DPLU. As discussed in the Technical Memorandum, replacing Tier 1 equipment with Tier 2 equipment would an average reduction in non-methane hydrocarbon (NMHC) and NOx of 25.74%, an average reduction in CO of 30.69%, and an average reduction in PM of 48.59%. Assuming that a minimum of ten percent of the equipment would meet these standards, the associated reduction in emissions would be 2.57% for NOx, 3.07% for CO, and 4.86% for PM. Because this measure would remain a requirement for construction of the Otay Crossings Commerce Park, the heavy construction equipment would continue to meet the standards prescribed by the DPLU and emissions would be either unchanged or lower than those presented in the Air Quality Technical Report and the Technical Memorandum.

The Air Quality Technical Report also included a health risk analysis to evaluate potential risks associated with exposure to diesel particulate matter from construction activities. Because the

[6] Scientific Resources Associated. 2011. *Technical Memorandum, Otay Crossings*. May 19.

emissions would be the same or lower with adoption of the revised TM, the adoption of the revised TM would not result in significant impacts to sensitive receptors.

Adoption of the revised TM would not conflict with or obstruct implementation of the San Diego County State Implementation Plan or Regional Air Quality Strategy. Adoption of the revised TM would therefore not result in increased air quality impacts associated with construction. Nonetheless, significant and unmitigated air emissions impacts would still occur during project construction.

Air Quality Impacts - Operations

Air quality impacts associated with operations were evaluated in the Air Quality Technical Report[7], which was approved by the DPLU in 2010. The analysis in the Air Quality Technical Report was based on development of 311.5 acres into 56 industrial lots and three open space lots. Approximately 238.4 acres were proposed to be placed in industrial lots (including FHWA/Caltrans/GSA ROW), while 20.4 acres would contain internal on-site public streets, and the construction of roads adjacent to the site would occupy 5.6 acres. The revised TM would subdivide the 311.5-acre property into 44 industrial lots and 3 open space lots. This change would result in 12 fewer industrial lots from the map that was approved by the County in October 2011. The 47 lots would be divided and recorded in five separate units. Approximately 238.4 acres would be placed in industrial lots (including FHWA/Caltrans/GSA ROW), while 25.4 acres would contain internal on-site public streets.According to the project traffic engineer,[8] the average daily trips (ADT) generated by the project would be reduced from 21,279 ADT to 19,731 ADT with truck parking, a reduction of 1,548 ADT. Without truck parking, the reduction would be 2,004 ADT, which would result in further emission reductions.

Table 1 presents a comparison of the operational emissions estimated for the previously approved TM versus the emissions estimated for the revised TM.

Table 1
Operational Emissions (Buildout)
Otay Crossings

Previously Approved Tentative Map						
Source	**CO**	**VOCs**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Area Sources	0.68	0.06	0.81	-	0.00	0.00
Vehicular Emissions	558.14	83.61	82.76	1.19	13.05	8.36
Total, lbs/day	**558.82**	**83.67**	**83.57**	**1.19**	**13.05**	**8.36**
Revised Tentative Map						
Source	**CO**	**VOCs**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Area Sources	0.68	0.06	0.81	-	0.00	0.00
Vehicular Emissions	517.54	77.52	76.74	1,10	12.10	7.75
Total, lbs/day	**518.22**	**77.58**	**77.55**	**1.10**	**12.10**	**7.75**
Screening-Level Thresholds	550	75	250	250	100	55

As shown in Table 1, the emissions with the revised Tentative Map would be reduced. Impacts would therefore be lower than evaluated in the Air Quality Technical Report. Specifically, emissions of CO and VOCs would be below the screening-level thresholds and project impacts would be reduced below

[7] Scientific Resources Associated. 2009. *Air Quality Technical Report for the Otay Crossings Commerce Park*. December 14.
[8] Darnell and Associates. 2013. *Focused Traffic Analysis of the Otay Crossings Commerce Park Revised Tract 5405, RPL 7R Project.* January 7.

significance under the revised Tentative Map. Therefore, significant and unmitigable air quality impacts identified in the certified FEIR would be avoided with the revised Tentative Map.

Based on the Traffic Impact Analysis for the revised Tentative Map, because the project would generate fewer ADT, impacts on intersections would be lower than evaluated for the approved project. No CO "hot spots" were predicted for project operations. This conclusion would be unchanged for the revised Tentative Map.

Global Climate Change Analysis

The Global Climate Change Technical Report that was prepared for the Otay Crossings project was prepared in accordance with the County DPLU guidelines that were in effect at the time that the analysis was prepared. As with the criteria pollutant emissions, the revised Tentative Map would result in similar construction-related GHG emissions and lower operational GHG emissions than the approved project due to reduced industrial development and related sources of GHG emissions, including traffic, energy usage, and water usage. Because emissions would be lower, the project would not interfere with California's ability to achieve GHG reduction goals and strategies as identified in AB 32 and Executive Order S-01-07 and impacts would remain less than significant.

Earthmoving Fugitive Dust Emissions - Otay Crossings Commerce Park

Source: **Equipment loading (material handling)**

E = k x 0.0032 x (U/5)^1.3/(M/2)^1.4

k	0.35	
U	5.816	mph
M	24	%

Emission Factor, lbs/ton

4.20451E-05

Tons handled

20000	cubic yards/day
1.2641662	tons/cubic yard
25283.324	tons/day

Emissions 1.063038907 lbs/day

Source: **Travel on Unpaved Surfaces**

E = ((k x (s/12)^1 x (S/20)^0.5)/(M/0.5)^0.2) - C) x (1 - P/365)

k	1.5
s	8.5
S	10
M	12
C	0.00047
P	0

Emission Factor, lbs/VMT

0.324412309

Vehicle Trips

20000	cubic yards/day
30	cubic yards/scraper
2	trips/scraper (out and back)
1333.333333	total trips
0.151515152	VMT per trip

Emissions (uncontrolled)	65.53784019	lbs/day
Control Factor	0.75	
Emissions (controlled)	16.38	lbs/day