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Executive Office of Energy & Environmental Affairs

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February 28, 2018

Walter Heller, Acting Highway Director, District 6
Massachusetts Department of Transportation
Highway Division
185 Kneeland Street, 10th Floor
Boston, MA 02111

Re: Final Acceptance of the Massachusetts Department of Transportation Central Artery/Tunnel Project 2016 Renewal Operating Certification Under 310 CMR 7.38

Dear Mr. Heller:

Summary of 2016 Renewal Application for the Central Artery/Tunnel Project (CA/T Project) Operating Certification

On July 28, 2016, the Massachusetts Department of Environmental Protection (MassDEP) received a request from the Massachusetts Department of Transportation (MassDOT) to review and accept the renewal application for the Central Artery/Tunnel Project (CA/T Project) Operating Certification pursuant to "Certification of Tunnel Ventilation Systems in the Metropolitan Boston Air Pollution Control District," 310 CMR 7.38 (hereafter referred to as the "2016 Renewal Application"). MassDOT's 2016 Renewal Application included the Technical Support Document (TSD) entitled, "Central Artery (I-93)/Tunnel (I-90) Project, Operating Certification of the Project Ventilation System" dated July 28, 2016, as well as several appendices. On August 15, 2016, MassDEP notified MassDOT that the 2016 Renewal Application was incomplete and required the submission of supplemental information to complete its review and to initiate the public review and determination process pursuant to 310 CMR 7.38(5). MassDOT provided the requested supplemental information to MassDEP in a revised 2016 Renewal Application on September 12, 2016. MassDEP reviewed this revised 2016 Renewal Application and found it to be complete on September 14, 2016. Once MassDEP determined that the 2016 Renewal Application was complete, pursuant to 310 CMR 7.38(5) and (11), MassDEP gave notice and held a public hearing on October 19, 2016 soliciting comments on the 2016 Renewal Application. The public comment period ended on October 31, 2016. MassDEP did not receive any public comments.

Based on the information provided in the revised Renewal Application submitted in September 2016, MassDEP is approving the 2016 Final Acceptance of the Renewal Operating Certification (hereby referred to as the "2016 Final Acceptance"). MassDOT shall comply with all of the requirements contained in the 2016 Final Acceptance which incorporates the limits and requirements included in the 2016 Renewal Application and the specific requirements detailed below. This letter constitutes approval of the 2016 Final Acceptance of the operating certification and this final acceptance expires on December 31, 2021.

BACKGROUND

1. Overview of Certification of Tunnel Ventilation Systems Regulation

The requirements of 310 CMR 7.38 apply to the construction and operation of any tunnel ventilation system for highways within the Metropolitan Boston Air Pollution Control District. The regulations, promulgated in 1990, provide for comprehensive and systematic air quality analysis of highway tunnel ventilation systems to ensure that the emissions from tunnel ventilation systems do not result in an exceedance of either the National Ambient Air Quality Standards (NAAQS) or MassDEP guidelines.

Pursuant to 310 CMR 7.38, no person shall construct or operate a tunnel ventilation system or open for general public use any project roadway without first certifying and receiving written acceptance by MassDEP that the project will not cause or exacerbate a violation of the NAAQS, air pollution guidelines, or criteria specified in 310 CMR 7.38(2)(a) through (c).

Pursuant to 310 CMR 7.38(4)(c), any operating certification accepted by MassDEP shall remain in effect for five years from the date of acceptance and shall contain such conditions as MassDEP deems necessary to meet the certification criteria established in 310 CMR 7.38(2)(a) through (c). At the time of the renewal, MassDEP shall apply the same criteria that apply to the acceptance of pre-construction certification and the initial operation certification to the renewal of an operating certification.

2. Prior Certifications

In accordance with 310 CMR 7.38(2), MassDOT submitted a preconstruction certification for the CA/T project to MassDEP that met all of the requirements in 310 CMR 7.38(3)(a). MassDEP received MassDOT's preconstruction certification, and after review of the preconstruction certification, it held a public hearing and comment period. Pursuant to 310 CMR 7.38(3), MassDEP accepted the preconstruction certification on July 8, 1991. Once MassDEP accepted the certification, MassDOT could commence operation of the CA/T project.

In 2006, MassDOT submitted the 2006 Operating Certification Application which established Emission Limits for carbon monoxide (CO), nitrogen oxides (NO_x), and particulate matter 10 micron in diameter (PM_{10}). That application demonstrated that these Emission Limits would ensure compliance with the CO, NO_2, and PM_{10} NAAQS and the NO_2 guidelines. It also established a regional emissions budget for volatile organic compounds (VOC). On December 22, 2006, MassDEP issued the Final Acceptance of the 2006 operating certification (hereafter

referred to as the "2006 Final Acceptance"). In 2011, MassDOT submitted the 2011 Renewal Application. On December 19, 2011, MassDEP issued a Conditional Acceptance for the 2011 Renewal Application that approved MassDOT's request to submit a Supplemental Application. On July 25, 2012, MassDEP issued the Final Acceptance of the 2012 Supplemental Application. The regulations require renewal of the operating certification every five years.

3. 2016 Renewal Application Summary

On July 28, 2016, MassDOT submitted the 2016 Renewal Application. After MassDEP requested the submission of additional information, MassDOT submitted a revised 2016 Renewal Application on September 12, 2016. The 2016 Renewal Application included a TSD divided into four parts:

Part I – Ventilation System – Operation Emission Limits
Part II – Compliance Monitoring Program
Part III – Record Keeping and Reporting
Part IV – Corrective Action.

The 2016 TSD included several appendices and attachments that MassDOT developed and relied upon as part of its certification application.

As required under 310 CMR 7.38(4)(c), the 2016 Renewal Application included changes and updates of required air quality compliance requirements, summaries of air quality and traffic monitoring data collected since 2012, a review of feasible control technologies, and procedure updates since 2011.

Listed below is a summary of major updates/changes since the 2011 Renewal Application (these changes are explained in more detail in the section below entitled "Specific Requirements of the 2016 Final Acceptance"):

- CO Continuous Emissions Monitor (CEM) Reduction at Ventilation Buildings (VBs)
  MassDOT is currently operating 25 CO CEMs at 12 locations throughout the CA/T Project that includes 6 VBs (including 2 CO monitors at VB 7), 3 ramps, and 2 monitors at Dewey Square Tunnel (DST). An analysis of 9 years of data collected indicates that the VBs had maintained peak CO levels (ranging from 0.5 to 10.1 parts per million (ppm)) at 10-15% of the emission limit of 70 ppm and peak levels never reached even 50% of the emission limit at any VB zone. Therefore, MassDEP is allowing MassDOT to reduce the number of VB CO monitors from 25 to 7.

- Emission Limits and Action Levels
  Based on the most current background levels from nearby air quality monitoring stations, 2012-2015 meteorological data, and receptor locations based on the current buildings configuration in the area surrounding each VB, revised emission limits for CO, NOx, and $PM_{2.5}$ were established for VBs, exit Ramps, and the DST. In addition, the 2016 VOC regional emissions for the CA/T area was

modelled in the range of 2,000 kilograms (kg)/day, much lower than the 2005 VOC emission budget of 6,095.9 kg/day, due to cleaner vehicles.

CO monitoring is used under 310 CMR 7.38 to compare to the emission limits and action levels in Tables 1 and 2 below both for CO and (through a correlation verified by testing) for NOx. Testing to update the CO-NOx correlation showed an unacceptably weak CO-NOx correlation for one location: the DST. Therefore, after issuance of this 2016 Final Acceptance, MassDOT will install a NOx monitor at DST to directly measure NOx for comparison to the NOx emission limits and action levels in Tables 1 and 2.

Traffic monitoring is a requirement of 310 CMR 7.38(8)(b). In the near future, the CA/T Integrated Project Control System (IPCS) will be upgraded and may not support the existing traffic counting loops. MassDOT will inform MassDEP of methods to record traffic data that are developed as part of the upgrade.

SPECIFIC REQUIREMENTS OF THE 2016 FINAL ACCEPTANCE

1. CO CEM Reduction at VBs

MassDOT is currently conducting CO CEM at 12 locations throughout the CA/T Project that includes 6 ventilation buildings (including 2 CO monitors at VB 7), 3 ramps, and 2 monitors at DST.

In the 2016 Renewal Application, MassDOT requested the reduction of CEMs by eliminating certain CO monitors for the 6 CA/T VBs serving I-90 and I-93.

CO data was collected at 6 VBs from 2006-2014. The data provide the maximum hourly and average levels by year for all 6 VBs during the 9 year period. Results indicate that the full transverse ventilation system had maintained peak CO levels (ranging from 0.5 to 10.1 parts per million (ppm)) at 10-15% of the emission limit of 70 ppm and peak levels never reached even 50% of the emission limit at any full transverse ventilation zone. In addition, traffic volumes within the CA/T tunnels have been stable and vehicles have become much cleaner such that CO levels are not expected to increase. Based on the data sets indicating very low CO levels and cleaner vehicles, MassDEP is allowing MassDOT to reduce the number of CO monitors from 25 to 7.

The elimination of these 18 CO VB CEMs will result in significant labor savings for MassDOT. The equipment that will no longer be needed at the eliminated VBs will be refurbished and used as spares for the remaining monitoring sites.

Since the CEMs conducted at the ventilation buildings and ramp locations will provide appropriate monitoring data to ensure compliance with the established Emission Limits in Table 1 below, MassDEP hereby approves MassDOT's request to reduce CEM requirements at the VBs.

2. Emission Limits and Action Levels

a. Emission Limits

MassDEP approves the Emission Limits shown in Table 1 below that were developed to ensure that all NAAQS for 1-Hour and 8-Hour CO, 1-Hour NO_2 and 24-Hour $PM_{2.5}$ and MassDEP's One Hour NO_2 Guideline will not be violated in the CA/T Project area. Air pollutant emission rates from the CA/T Project shall be kept to the lowest practical level at all times, but shall not exceed the Emission Limits as specified in Table 1. In addition, NO_x Emission Limits for each Ventilation Zone except DST are based upon the approved NO_x conversion factors ($NO:NO_2$), dilution ratios, and air quality modeling techniques appropriate for all VB and longitudinally ventilated ramp applications.

Since there is no NAAQS for VOC, a concentration based emission limit is not viable. In 2002, MassDOT and MassDEP air quality working group developed procedures to address the VOC requirements. The 2005 build year baseline emissions budget of 6,095.9 kg/day was established in the 2006 Operating Certification and is the baseline against which future renewal certification's VOC emission budgets shall be compared. For the 2016 Renewal Application, MassDOT used MOVES 2014a (EPA's Motor Vehicle Emission Simulator) to estimate the regional VOC levels. Based on the significant decreases in VOC emissions from motor vehicle emissions and the current O_3 attainment status of the Boston Metro area, MassDEP agreed that this simplified method is an acceptable approach in estimating VOC levels. The 2016 renewal application demonstrated that the VOC emissions budget in 2016 (resulting from the regional analysis using MOVES 2014a) is in the range of 2,000 kg/day, which is well below the 2005 baseline emissions budget of 6,095.9 kg/day.

b. Demonstration of Compliance with Emission Limits

CEMs for CO are located in VBs 1, 3, 4, 5, 6, and 7 (2 monitors) and at longitudinally ventilated exit Ramps CN-S, CS-SA, CS-P, and DST (2 monitors) and will be used to obtain emission concentrations to compare against Emission Limits for CO. CEMs for $PM_{2.5}$ are located in VBs 3, 5 and 7 and at the portal area of Ramp CS-SA and will be used to obtain emission concentrations to compare against the Emission Limits for $PM_{2.5}$.

MassDOT will continue to use a CO/NO_x regression model to determine NO_x emission levels (from measured CO emission levels) for comparison with NO_x Emission Limits using separate modeling procedures for VBs and longitudinally ventilated ramps, excluding DST. MassDOT will now use direct NO_x monitoring to determine NOx emission levels for comparison with NO_x Emission Limits for DST. The NO_x Emission Limits for each Ventilation Zone ensure that NO_x emissions will not exceed MassDEP's One-Hour Guideline for NO_2 or the NAAQS for NO_2.

Table 1. Summary of Emission Limits (2016-2021)

Location*	1-Hr CO Emission Limit (ppm)	8-Hr CO Emission Limit (ppm)	1-Hr NO_x Emission Limit (ppm)	24-Hr $PM_{2.5}$ Emission Limit (ug/m^3)**
VB 1	70	70	6.1	NA
VB 3	70	70	6.1	550
VB 4	70	70	6.1	NA
VB 5	70	70	6.1	550
VB 6	70	70	6.1	NA
VB 7	70	70	6.1	550
Ramp CN-S	35	59	3.2	NA
Ramp CS-SA	35	54	3.2	35***
Ramp CS-P	35	70	3.2	NA
DST	22	24	2.1	NA

Acronyms are defined as: Central Artery Northbound to Storrow Drive (CN-S), Central Artery Southbound to Surface Artery (CS-SA), Central Artery Southbound to Purchase Street (CS-P), Dewey Square Tunnel (DST), part per million (ppm), microgram per cubic meter ($\mu g/m^3$).

* Each ventilation building location includes all associated ventilation zones.

** Compliance with the 24-hour $PM_{2.5}$ NAAQS is based on the monitoring design value, which is given by the 3-year average of the annual 98th percentile value of daily average concentrations. The form of the standard allows, on average, for the numerical value of the standard (35 $\mu g/m^3$) to be exceeded on seven calendar days per calendar year without triggering a violation of the NAAQS.

*** The ambient $PM_{2.5}$ monitor is located outside ramp CS-SA.

c. Emission Action Levels

As part of the 2016 Final Acceptance, MassDEP hereby approves the CO, NO_x, and $PM_{2.5}$ Emission Action Levels for Ventilation Zones contained in Table 2. The Emission Action Levels were established to minimize the potential for exceedances of the Emission Limits. As long as the CO, NO_x, and $PM_{2.5}$ emissions remain below the CO, NO_x, and $PM_{2.5}$ Emission Action Levels for each Ventilation Zone in Table 2, emissions from the CA/T Project will not exceed the Emissions Limits in Table 1.

The Emission Action Levels for CO are set within a range between 80% and 85% of the CO Emission Limits. CO CEMs output shall be averaged over sixty minutes except for DST (see below for DST). MassDOT's Highway Operation Center (HOC) display for each Ventilation Zone at any moment shall show the rolling average of the CO values from the CO CEMs over the preceding sixty minutes, which rolling 1-hour average will be updated at least every minute. This will enable HOC staff sufficient time to take corrective action.

The Emission Action Level for NO_x is set at approximately 80% of the NO_x Emission Limit. The NO_x and CO CEM output for DST shall be averaged over fifteen minutes. The HOC display for DST at any moment shall show the rolling average of the NO_x values from the NO_x CEM and the CO values from the CO CEM over the preceding fifteen minutes, which rolling fifteen minutes average will be updated at least every minute. This will enable HOC staff sufficient time to take corrective action.

The Emission Action Levels for $PM_{2.5}$ are set at 550 $\mu g/m^3$ for a rolling eight hour period instead of 24 hours, which is approximately one third of the time (24-hour Emission Limit). The HOC display for each Ventilation Zone at any moment shall show the rolling average of the $PM_{2.5}$ values from the $PM_{2.5}$ CEMs over the preceding eight hours, which rolling 8-hour average will be updated at least every minute. This will enable HOC staff sufficient time to take corrective action.

Table 2. Emission Action Levels (2016-2021)

Location*	Rolling 1-Hour CO Emission Action Level (ppm)	Rolling 15 Minute CO Emission Action Level (ppm)	Rolling 15 Minute NOx Emission Action Level (ppm)	Rolling 8-Hour $PM_{2.5}$ Emission Action Level ($\mu g/m^3$)
VB 1	60	NA	NA	NA**
VB 3	60	NA	NA	550
VB 4	60	NA	NA	NA**
VB 5	60	NA	NA	550
VB 6	60	NA	NA	NA**
VB 7	60	NA	NA	550
Ramp CN-S	28	NA	NA	NA
Ramp CS-SA	28	NA	NA	35***
Ramp CS-P	28	NA	NA	NA
DST I-90	NA	18	NA	NA
DST I-93	NA	18	1.7****	NA

* Each ventilation building location includes all associated ventilation zones.
** VB 1, VB 4, and VB 6 do not have $PM_{2.5}$ monitors. Action levels at VB 3, VB 5, and VB 7 will be used as surrogates for these locations.
*** Action level for ramp CS-SA is for 24 hours and is set to 100% of the 24-hour $PM_{2.5}$ NAAQS.
**** NO_x action level is directly compared to the NO_x monitor data.

3. Contingency Plan and Mitigation Plan

a. Contingency Plan

Pursuant to 310 CMR 7.38(4)(b), the 2016 Renewal Application includes the required Contingency Plan (hereafter referred to as the "Contingency Plan") which must be implemented when the Emission Limits in Table 1 are exceeded. (See the 2016 Renewal Application Part IV– CORRECTIVE ACTIONS for the Contingency Plan.) MassDEP accepts MassDOT's Contingency Plan as part of this final approval.

The primary aim of MassDOT's Contingency Plan is to implement pre-emptive actions when the Action Levels are exceeded in order to avoid exceedances of Emission Limits. This approach relies on in-tunnel CO and $PM_{2.5}$ monitoring data from each ventilation zone that triggers the HOC to increase ventilation rates to avoid exceedances of Emission Limits. MassDOT's Contingency Plan includes this commitment to alternative tunnel ventilation system operations and maintenance procedures for CO, NO_x, and $PM_{2.5}$ for all ventilation zones as described below.

In the unlikely event that an Emission Limit is exceeded, MassDOT shall comply with the following procedures as proposed in the Contingency Plan. First, MassDOT shall verbally notify

MassDEP of this exceedance within 12 hours of such an occurrence. This verbal notification shall be followed with a written notification to MassDEP within 48 hours of the Emission Limit exceedance. The written notification shall be made to MassDEP, Bureau of Air and Waste, Division of Air and Climate Programs, Transportation Management Programs Branch, 1 Winter Street, Boston, MA 02108. MassDOT shall verbally notify Transportation Management Programs Branch by calling 617-292-5762; if unable to reach staff or supervisors directly, then MassDOT shall leave a message at MassDEP's Emergency Response at 888-304-1133.

Second, MassDOT shall perform an Emission Limit Assessment (ELA)[1] to determine whether the Emission Limit exceedance may cause or contribute to a violation of the relevant NAAQS or MassDEP guideline. The 2016 Renewal Application includes different procedures for emission limit assessments at ventilation buildings and longitudinally ventilated ramps, including DST. The ELA will include the use of site-specific meteorological and background conditions at the time of the exceedance.[2] Meteorological data collected by the National Weather Service at Boston's Logan International Airport is acceptable. The analysis shall be provided within three business days from the date MassDOT receives background conditions data collected by MassDEP to MassDEP, Bureau of Air and Waste, Division of Air and Climate Programs, Transportation Management Programs Branch, 1 Winter Street, Boston, MA 02108. Based on MassDOT's analysis, if MassDEP determines that a violation of a NAAQS or MassDEP One Hour NO_2 Policy Guideline has occurred, MassDEP will post a notice of the violation on MassDEP's web site within ten business days of MassDEP's determination and in the MEPA Environmental Monitor as a matter of public record.

As part of the 2016 Final Acceptance, MassDEP hereby approves MassDOT's ELA approach effective immediately. In addition, MassDEP approves MassDOT's approach, which triggers interagency consultation to discuss possible mitigation measures when three exceedances of the NO_2 NAAQS occur in a single year at one location for any ventilation building location, longitudinally ventilated ramp, and DST as described in the 2016 Renewal Application.

b. Mitigation Plan

Pursuant to 310 CMR 7.38(6), if MassDEP determines that a violation of a NAAQS or MassDEP One Hour NO_2 Policy Guideline has occurred or is likely to occur, MassDOT must submit a Mitigation Plan to MassDEP for review and approval that complies with the requirements in 310 CMR 7.38(6)(a) and (b).

4. Operational Requirements When There Are Exceedances of Action Levels

MassDOT shall use the CEM equipment installed at certain Ventilation Zones and longitudinally ventilated ramps shown in Tables 3, 4, and 5 to determine real-time CO, NOx, and $PM_{2.5}$ emissions and to trigger alarms when CO, NOx or $PM_{2.5}$ Action Levels, as defined in Table 2, are reached.

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[1] An ELA is a modeling analysis that examines the air quality conditions including the NO_2 concentrations, the background emissions, the wind speed and the wind direction at the time of the emission limit exceedance for each designated receptor within the vicinity of the subject ventilation building or longitudinally ventilated ramp where an emission limit was exceeded.

[2] At the time of the written notification to MassDEP, MassDOT must obtain meteorological data and request background concentrations during the exceedance time period necessary to perform the ELA.

Table 3. Ventilation Zones Associated with CO CEMs

CO Monitor Location	Ventilation Buildings and Zones in which to increase ventilation rate	
	Ventilation Building	Ventilation Zone
VB 1 in Exhaust 10&11	1	Ramp D I-90 WB to I-93 NB
VB 3 in Ventilation Zone SB-1	3	I-93 SB-1
VB 4 in Ventilation Zone NB-4	4	I-93 NB-4
VB 5 in Ventilation Zone EB-2	5	I-90 EB-2
VB 6 in Ventilation Zone WB	6	I-90 WB
VB 7 in Ventilation Zone EB-3 & EB Ramp TA/D	7	I-90 EB-3 and EB Ramp TA/D
Ramp CN-S Exit Portal	8	Ramp CN-S
Ramp CS-P Exit Portal	3	Ramp CS-P
Ramp CS-SA Exit Portal	4	Ramp CS-SA
DST I-90 Exit Portal	DST Air Intake Structure, 3, 4	Ramp DST I-90

Table 4. Ventilation Zones Associated with NO_x CEM

NOx Monitor Location	Ventilation Buildings and Zones in which to increase ventilation rate	
	Ventilation Building	Ventilation Zone
DST I-93 Exit Portal	DST Air Intake Structure, 3, 4	Ramp DST I-93

Table 5. Ventilation Zones Associated with $PM_{2.5}$ CEMs

$PM_{2.5}$ Monitor location	Ventilation Buildings and Zones in which to increase ventilation rate	
	Ventilation Building	**Ventilation Zone**
VB 3 in Ventilation Zone Northbound 1 (NB-1)	3	NB-1 and NB-2
	4	NB-3 and NB-4
VB 3 in Ventilation Zone Southbound 1 (SB-1)	3	SB-1
	4	SB-2 and SB-3
	DST Air Intake Structure	DST
VB 5 in Ventilation Zone Westbound 2 (WB-2)	1	Ramp D I-90 WB to I-93 NB and both parts of I-90 WB-1
	5	WB-2 and WB-3
	6	WB-1
	7	WB-2 and WB-3
VB 7 in Ventilation Zone Eastbound 2 (EB-2)	1	I-90 EB-1 and both parts of Ramp L/HOV for I-90 EB
	5	EB-2 and EB-3
	6	EB
	7	EB-2, EB-3 and Ramp T-A/D
Ramp CS-SA	4	*

* Ramp CS-SA Action Level response described below.

When a CO or NO_x Action Level is exceeded, the CO or NO_x alarm is triggered which requires HOC staff to increase supply and exhaust air fan speeds (to maintain stable air flows where available) in an affected Ventilation Zone location as indicated in Table 3 or 4 and continue to increase fan speeds until CO or NO_x emission levels are below the alarm set point (i.e., Action Level).

When a $PM_{2.5}$ Action Level is exceeded, the $PM_{2.5}$ alarm is triggered which requires HOC staff to increase the ventilation rate to a minimum of Step 3 in the affected Ventilation Zone location as indicated in Table 5. HOC staff shall continue to modify fan speeds until $PM_{2.5}$ emission levels are below the alarm set point (i.e., Action Level) as indicated in Table 2. MassDOT shall also investigate the cause of the exceeded emission Action Level and take appropriate corrective measures as necessary.

Ramp CS-SA represents an ambient location, and as such, any increased ventilation rate at this location may not remediate $PM_{2.5}$ levels. When the Action Level for ramp CS-SA is exceeded, MassDOT shall investigate the cause of the Action Level exceedance. If the investigation identifies outside tunnel conditions, such as the presence of idling vehicles or a pattern of traffic congestion at Ramp CS-SA traffic sufficient to cause an Action Level exceedance, then MassDOT shall make a good faith effort to work with the Boston Transportation Department (BTD) to develop an interagency agreement to implement one or more remedial actions by BTD, including but not limited to increased enforcement of anti-idling laws, changing the traffic signalization affecting Ramp CS-SA, eliminating left turn options, or adding a police detail to facilitate the movement of traffic in the Ramp CS-SA area. The purpose of developing an

interagency agreement is to establish the means to expeditiously implement remedial actions to address the influence of outside tunnel conditions. If the investigation identifies inside tunnel conditions including traffic patterns sufficient to cause an Action Level exceedance, then MassDOT shall implement alternative ventilation system operations and maintenance at Ramp CS-SA.

For DST, MassDOT shall continue to operate the ventilation fans for the Dewey Square Air Intake Structure, along with Ventilation Zone SB-1 from VB 3, at Step 3 each weekday afternoon from 2:30 p.m. to 6:00 p.m., at a minimum. The 2:30 p.m. start time for Step 3 ventilation settings helps ensure sufficient ventilation in advance of predictable p.m. peak period traffic conditions.

Furthermore, MassDEP approves as part of the 2016 Final Acceptance, MassDOT's operating procedures designed to minimize future exceedances of Emission Limits, including those exceedances related to nighttime maintenance activities that may occur in proximity to the CEM sampling probes. In response to an Action Level alarm, MassDOT's HOC operator shall manually increase the ventilation for the full southbound CA/T tunnel (including DST-AIS, VB 3 (southbound 1) and VB 4 (southbound 2 and 3)) to Step 3 and beyond Step 3 if the CO level does not decrease within the following 15-minute period.

5. Future Development of Parcels 6 and 12 and DST Partial/Full Build

The required modeling used to establish Emission Limits for CO and NO_x in the 2006 Final Acceptance showed that future development at Parcels 6 and 12 and DST would require more stringent emission limits for affected ventilation zones to protect sensitive receptors that would exist after completion of the development. The development proposal for Parcels 6 and 12 has changed: the initial plan was for development of elevated structures, whereas the current proposal for both parcels includes only parkland features. Therefore, MassDOT updated their analysis to develop the standards for the CS-SA ventilation zone in Table 1. Continuing the requirement initially established in the 2006 Final Acceptance, this 2016 Final Acceptance requires MassDOT to provide MassDEP with a written annual update regarding the status of ramp covers and development activities at Parcels 6 and 12 and DST.

The 2016 Final Acceptance requires that such written updates continue yearly until completion of the above described developments. These updates shall also indicate whether the sensitive receptors used by MassDOT to develop the post-development Emission Limits have changed or are likely to change, such that even stricter Emission Limits would be required. Accordingly, MassDOT shall submit the annual updates on February 1st of each year.

6. Incident Remedial Measures

MassDOT's 2006 Final Acceptance included Response Procedures for HOC to manage and remediate incidents, such as breakdowns, collisions, and blockages (not including tunnel fires) that might occur in the tunnel system and could affect the nature and extent of emissions regulated under 310 CMR 7.38. Based on observations of incidents and response, MassDEP has determined that the Response Procedures developed by MassDOT to deal with such incidents are still necessary and shall remain in effect.

In the event of an incident, the main Response Procedure activities are to:

1. Identify an incident and notify Incident Response Operations (IRO);
2. Assess the incident;
3. Remove the problem from the tunnel;
4. Ramp-up fans in impacted Ventilation Zone(s);
5. Update MassDOT traffic warning system and web site;
6. Check traffic queue to make sure that initial incident has not caused additional problems; and
7. Contact Boston Emergency Medical Services/Boston Fire Department, as necessary.

7. Emergency Conditions

An "emergency condition" means any situation arising from sudden and/or reasonably unforeseeable events beyond the control of MassDOT, including acts of God, which would require immediate corrective action to protect public safety, and that causes the ventilation zone to exceed an Emission Limit due to unavoidable increases in emissions attributable to the emergency. The most likely emergency situation envisioned by this definition is a vehicle fire in one of the tunnels. However, an emergency condition does not include situations arising from improperly designed equipment, lack of preventative maintenance, careless or improper operations, operator error, or a decision to keep operating despite knowledge of any of these things.

In the event of an emergency situation (e.g., a vehicle fire in one of the tunnels), MassDOT shall follow the notification procedures outlined under Requirement 3 and provide MassDEP with the following information through properly signed, contemporaneous operating logs, or other relevant evidence that demonstrates:

1. An emergency incident occurred within the CA/T Project area and that MassDOT can identify the nature and circumstances of the emergency;

2. The ventilation systems in those sections of the project area not affected by the emergency were properly operated at the time;

3. MassDOT took all reasonable steps as expeditiously as possible after the emergency incident was rectified to restore normal operations and minimize levels of emissions that would exceed the emissions limits, or instituted other actions required in this Final Acceptance;

4. Relevant public safety agencies responded to the emergency as documented in incident reports or official records of the event from the responding agencies; and

5. If an emergency episode requires immediate notification to the MassDEP Bureau of Waste Site Cleanup/Emergency Response, notification to the appropriate parties shall be made as required by law and regulation.

8. Compliance Monitoring

As required by 310 CMR 7.38(8)(a), MassDOT shall continue to operate CO and $PM_{2.5}$ CEMs as detailed in the Continuous Emissions Monitoring Air Emissions Monitoring Protocol (AEMP)

submitted and approved as part of the 2016 Renewal Application. If MassDOT proposes to modify the approved AEMP, a revised protocol must be submitted to MassDEP prior to the modification being made. Major modifications to the AEMP, as determined by MassDEP, are subject to the public hearing process in 310 CMR 7.38(5) and only approved modifications may be implemented. Minor modifications to the AEMP necessary to refine and/or improve data collection from time to time, such as changes to Standard Operating Procedures and material substitution, must be submitted to and approved by MassDEP in writing prior to implementation of a modification.

In addition, MassDOT shall continue to monitor traffic within the project area as required by 310 CMR 7.38(8)(b). MassDOT shall record hourly traffic volumes at the following four locations:

1. I-93 Southbound in the vicinity of Causeway Street
2. I-93 Northbound in the vicinity of South Station
3. I-90 Westbound in East Boston
4. I-90 Eastbound in the vicinity of Fort Point Channel

Peak hourly, peak daily, and average daily traffic volumes at each of the four locations shall be reported to MassDEP as detailed in Section 9 below.

9. Record Keeping and Reporting Requirements

Pursuant to the requirements of 310 CMR 7.38(9)(a)1, all records and data from the CEMs and traffic count recorders described below shall be maintained by MassDOT for a period of five years. The most recent two years of data shall be readily available to MassDEP for inspection.

a. Emissions Data

MassDOT shall file quarterly emission reports no later than 30 days following the end of each calendar quarter. Emission reports shall be sent by US mail to MassDEP, Air Assessment Branch, Quality Assurance Section, 37 Shattuck Street, Lawrence, MA 01843-1398. An electronic copy of the transmittal letter with the CEM Data Summary sheets shall be sent to ngoc.hoang@state.ma.us. Emission reports shall contain a summary of continuous monitoring data showing any excursions above Emission Limits contained in the 2016 Final Acceptance. Evidence of each calibration event on the monitoring devices shall be included in the emission reports. Emission reports shall be submitted electronically, via storage media or e-mail. Emission reports shall contain ESC data files of calibrations and hourly monitoring results. In addition, a summary of any second-party audits conducted during the reporting period must be included. The summary reports should identify the monitors audited, the types of test conducted, and the outcome of the tests (e.g., pass/fail). Within 30 days of receipt by MassDOT of MassDEP comments on data validation documentation or status flags, MassDOT shall submit revised data files to MassDEP.

b. Traffic Data

MassDOT shall collect and record traffic data to be in compliance with 310 CMR 7.38(9). Data for traffic monitoring shall include at a minimum hourly and daily traffic volumes for both directions in I-93 and I-90. The traffic volumes are currently recorded using traffic counting

loops under the tunnel pavement. In 2017 and 2018, an upgrade of the CA/T Integrated Project Control System will be completed and may not support the existing traffic counting loops. Therefore, alternative methods to record the traffic data in the future are currently being evaluated by MassDOT, and MassDOT shall keep MassDEP informed on any new proposed traffic counting methods.

The traffic data shall be submitted quarterly to MassDEP. MassDOT shall file traffic data no later than 30 days following the end of each quarterly reporting period. Traffic data reports shall be sent by US mail to MassDEP, Air Assessment Branch, Quality Assurance Section, 37 Shattuck Street, Lawrence, MA 01843-1398. An electronic copy of the Traffic Data shall be sent to ngoc.hoang@state.ma.us.

c. Ventilation System Maintenance

As required by 310 CMR 7.38(9)(b), MassDOT shall retain ventilation system maintenance reports quarterly to be provided upon request. Each ventilation zone has multiple exhaust fans that serve that zone. Multiple fan redundancy enables routine and non-routine fan maintenance to occur with no loss of ventilation capacity. MassDEP requires that whenever any ventilation zone is reduced to only one available supply or one available exhaust fan because of routine or unscheduled, non-routine maintenance, MassDOT shall follow the notification procedures as outlined under Requirement 3 above and provide MassDEP with ventilation system maintenance reports. The written reports shall include a summary of maintenance checks performed, repairs to ventilation equipment, the days and the amount of time of the occurrences during which ventilation equipment was not operating in accordance with standard operation procedures, and measures taken to remediate the situation. Ventilation system maintenance reports shall be sent to ngoc.hoang@state.ma.us. If MassDOT chooses not to utilize the certification option in Requirement 10 below, the reports shall also be sent by US mail to MassDEP, Bureau of Air and Waste, Division of Air and Climate Programs, Transportation Management Programs Branch, 1 Winter Street, Boston, MA 02108.

d. Removal and Maintenance of Monitoring Equipment

As required by 310 CMR 7.38(10), MassDOT shall notify MassDEP if any equipment used to monitor emissions is removed, altered or rendered inoperative, or if there is unexpected and unavoidable failure of equipment that requires equipment removal or alteration, other than for routine maintenance periods. MassDOT shall submit such notification at least one month prior to planned equipment removal or alteration to MassDEP, Air Assessment Branch, Quality Assurance Section, 37 Shattuck Street, Lawrence, MA 01843-1398, with an electronic copy of the transmittal letter to ngoc.hoang@state.ma.us. In addition, MassDOT shall provide MassDEP with a verbal notification within one day when monitoring equipment is removed, altered or rendered inoperative, or if there is unexpected and unavoidable failure of equipment. MassDOT shall follow up with a written notification and explanation within seven days. The written notification shall be sent to ngoc.hoang@state.ma.us. If MassDOT chooses not to utilize the certification option in Requirement 10 below, the reports shall also be sent by US mail to MassDEP, Bureau of Air and Waste, Division of Air and Climate Programs, Transportation Management Programs Branch, 1 Winter Street, Boston, MA 02108. The removal and maintenance procedures are also listed in the 2016 Renewal Application TSD.

10. Compliance Certification

All documents submitted to MassDEP shall contain certification signed by a responsible official, as defined in 310 CMR 7.00, of truth, accuracy, and completeness. Such certification shall be in compliance with 310 CMR 7.01(2) and contain the following language:

"I certify that I have personally examined the foregoing and am familiar with the information contained in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment."

If MassDOT wishes to rely solely on electronic submittals for Requirements 9.c., 9.d. or 12, the responsible official from MassDOT is required to complete the attached *310 CMR 7.38: Certification Of The Authorized Representative for Electronic Filings* form and mail a copy to: MassDEP, Bureau of Air and Waste, Division of Air and Climate Programs, Transportation Management Programs Branch, 1 Winter Street, Boston, MA 02108. The responsible official only needs to submit this form the first time s/he makes an electronic submission in connection with the Central Artery/Tunnel Project (CA/T Project) Renewal Operating Certification under 310 CMR 7.38. If the Responsible Official certifying submittals related to the CA/T Project Renewal Operating Certification changes, the new person would need to submit this form prior to making any electronic submittal.

11. Noncompliance

Any noncompliance with this 2016 Final Acceptance constitutes a violation of 310 CMR 7.38 and is grounds for enforcement action. Pursuant to 310 CMR 7.38(6), if MassDEP finds that one or more of the criteria set forth in 310 CMR 7.38(2)(a) through (c) or any requirement of this 2016 Final Acceptance is being violated, or is likely to be violated within the period for which the Operating Certification is valid: MassDOT shall (i) implement the measures in the Contingency Plan identified and required in Requirement 3 above; and (ii) if required by MassDEP, shall submit to MassDEP for its review and approval a Mitigation Plan which fully complies with 310 CMR 7.38(6)(a) and (b).

Noncompliance may also be grounds for assessment of administrative or civil penalties under M.G.L. c.21A, §16 and 310 CMR 5.00; and civil penalties under M.G.L. c.111, §142A and 142B. This 2016 Final Acceptance does not relieve MassDOT from the obligation to comply with any other provisions of 310 CMR 7.00 or the Clean Air Act, or to obtain any other necessary authorizations from other governmental agencies, or to comply with all other applicable Federal, State, or Local rules and regulations, not addressed in the 2016 Final Acceptance.

12. Deviations

Deviations are instances where any requirement of the 2016 Final Acceptance is violated at a time other than an emergency condition pursuant to Requirement 7 above. Reporting a deviation is not an affirmative defense for action brought for noncompliance. In addition to the Emission

Limit exceedance notification requirements in Requirement 3 above, MassDOT shall report within three business days, any discovery of such deviations to ngoc.hoang@state.ma.us. If MassDOT chooses not to utilize the certification option in Requirement 10 above, the reports shall also be sent by US mail to MassDEP, Bureau of Air and Waste, Division of Air and Climate Programs, Transportation Management Programs Branch, 1 Winter Street, Boston, MA 02108. Deviations of requirements contained in this 2016 Final Acceptance include:

1. Failure to comply with a requirement of the 2016 Final Acceptance;
2. Failure to capture sufficient valid emissions monitoring data or to maintain monitoring equipment as required by the 2016 Final Acceptance; and
3. Failure to perform QA/QC measures as required by the 2016 Final Acceptance.

13. 2016 Final Acceptance Term and Renewal

The 2016 Final Acceptance shall expire on December 19, 2021.

The CA/T Project may continue to operate under the 2016 Final Acceptance until MassDEP issues the final acceptance of the subsequent renewal application in 2021. In the event MassDEP has not taken final action on the subsequent renewal application prior to the expiration date of the 2016 Final Acceptance, the requirements in the 2016 Final Acceptance shall remain in effect until MassDEP takes final action on the subsequent renewal application, provided that a timely and complete renewal has been submitted in accordance with 310 CMR 7.38.

14. Reopening for Cause

The 2016 Final Acceptance may be modified, revoked, reopened, and reissued, or terminated for cause by MassDEP. The filing of a request by MassDOT for an acceptance revision, re-issuance, or termination, or a notification of a planned change or anticipated noncompliance will not stay any requirement of the 2016 Final Acceptance.

15. Duty to Provide Information

Upon MassDEP's written request, MassDOT shall furnish, within a reasonable time, any information necessary for determining whether cause exists for modifying, revoking and reissuing, or terminating this 2016 Final Acceptance, or for determining compliance with this 2016 Final Acceptance. Upon request, MassDOT shall furnish to MassDEP copies of records that MassDOT is required to retain by this 2016 Final Acceptance.

16. Duty to Supplement

MassDOT, upon becoming aware that any relevant facts were omitted or incorrect information was submitted in the 2016 Renewal Application, shall promptly submit such supplementary facts or corrected information. MassDOT shall also provide additional information as necessary to address any requirements that become applicable to the CA/T Project after the date a complete subsequent renewal application is submitted but prior to release of a final acceptance of the subsequent renewal application.

MassDOT shall promptly, on discovery, report to MassDEP a material error or omission in any records, reports, plans, or other documents previously provided to MassDEP and not already reported.

17. Inspection and Entry

Upon presentation of credentials and other documents as may be required by law, MassDOT shall allow authorized representatives or contractors of MassDEP to:

1. Enter upon MassDOT premises where the CA/T Project's activity is located or emissions-related activity is conducted, or where records must be kept under the requirements of the 2016 Final Acceptance;
2. Have access to and copy, at reasonable times, any records that must be kept under the requirements of the 2016 Final Acceptance;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under the 2016 Final Acceptance; and
4. Sample or monitor at reasonable times any substances or parameters for the purpose of assuring compliance with the 2016 Final Acceptance.

18. Severability Clause

The provisions of the 2016 Final Acceptance are severable, and if any provision of the 2016 Final Acceptance or the application of any provision of the 2016 Final Acceptance to any circumstances is held invalid, the application of such provision to other circumstances, and the remainder of the 2016 Final Acceptance, shall not be affected thereby.

Should you have any questions, please call Ngoc Hoang of MassDEP's Transportation Management Programs Branch, Division of Air and Climate Programs within the Bureau of Air and Waste, at 617-292-5762 or email ngoc.hoang@state.ma.us.

Sincerely,

Christine Kirby
Assistant Commissioner
Bureau of Air and Waste

cc. Rick McCullough, MassDOT, Director Environmental Engineering

310 CMR 7.38: Certification Of The Authorized Representative for Electronic Filings

Instructions

The first time a particular Responsible Official from the Massachusetts Department of Transportation certifies any document submitted electronically to MassDEP in connection with the Central Artery/Tunnel Project (CA/T Project) Renewal Operating Certification under 310 CMR 7.38, must provide a notarized copy of his/her signature to MassDEP by:

1. Providing a hand-written signature on this form, witnessed by a Notary Public.
2. Mailing the completed and signed form to:

MassDEP
Bureau of Air and Waste
Division of Air and Climate Programs
Transportation Management Programs Branch
1 Winter Street
Boston, MA 02108

Once the Responsible Official submits this form, that person does not need to submit it again in the future for any subsequent electronic submittal for the CA/T Project under 310 CMR 7.38. If the Responsible Official certifying submittals related to the CA/T Project Renewal Operating Certification changes, the new person would need to submit this form prior to making any electronic submittal.

Certification of the Authorized Representative

I certify that I am authorized to certify submittals on behalf of the Massachusetts Department of Transportation to MassDEP in connection with the Central Artery/Tunnel Project (CA/T Project) Renewal Operating Certification under 310 CMR 7.38.

_____ _____
Signature Title

_____ _____
Print Name Date Signed (MM/DD/YYYY)

_____ _____
Telephone Number Email Address

Jurat: (Must be completed by a Notary Public:)

On this _____ day of _____, 20__, before me, the undersigned notary public, personally appeared _____ (name of document signer), and proved to me through satisfactory evidence of identification, which was/were _____ _____ _____, to be the person who signed the preceding or attached document in my presence and who swore or affirmed to me that the contents of the document are truthful and accurate to the best of (his) (her) knowledge and belief.

_____
State

_____
County

_____
Notary Public Name (Printed)

_____
Notary Public Signature

_____
Date Signed (MM/DD/YYYY)

_____
Date My Commission Expires (MM/DD/YYYY)

Notary Seal: