SILVERTOWN TUNNEL

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Air Quality Management Plan
Royal Borough of Greenwich

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Contents

1. Overview

1.1 Introduction

The Silvertown Tunnel (STT) scheme involves the construction of a twin bore road tunnel providing a new connection between the A102 Blackwall Tunnel Approach on the Greenwich Peninsula (Royal Borough of Greenwich) and the Tidal Basin roundabout junction on the A1020 Lower Lea Crossing / Silvertown Way (London Borough of Newham). The project was formally granted development consent through a Development Consent Order (DCO) issued by the Department of Transport in May 2018. STT will be approximately 1.4km long and able to accommodate large vehicles including double-decker buses. It will include a dedicated bus, coach and goods vehicle lane, enabling TfL to provide additional cross-river bus routes. The scheme also includes the introduction of free-flow user charging on both the Blackwall Tunnel (northern portal located in London Borough of Tower Hamlets) and the new Silvertown Tunnel.

Transport for London (TfL) have entered into a Project Agreement with the Project Company Riverlinx (Project Co) who are responsible for the detailed design, construction, financing and maintenance of the tunnel and supporting infrastructure. A 5 year period of design and construction will be followed be a further 25 years of operation and maintenance. The Project Co has appointed Riverlinx CJV as the Design and Construction (D&C) Contractor responsible for undertaking the detailed design and construction of the STT scheme all in accordance with the constraints and parameters of the DCO, TfL specifications and other commitments made by TfL to stakeholders. Riverlinx CJV is a joint venture formed between Ferrovial Agroman (UK) Ltd, BAM Nuttall and SK Engineering and Construction Co Ltd.

1.2 Purpose

The purpose of the Air Quality Management Plan (AQMP), prepared by Riverlinx CJV, is to detail how Riverlinx CJV will implement measures to control and limit emissions to the atmosphere in terms of gaseous and particulate pollutants from vehicles and plant used on the worksites, and dust from construction, demolition, vehicles and plant activities, within the Royal Borough of Greenwich, during the construction of STT. Main works construction will run approximately from December 2020 to December 2024. This will be submitted for approval by the Local Authority. It is to be noted that this management plan does not address any matters of air quality associated with the operation of the STT.

1.3 Project Details

The tunnel will cause changes to the existing road network on both sides of the River Thames. On the south side of the river, the following changes to the A102 Blackwall Tunnel approach will be needed; widening the A102 Blackwell Tunnel approach to create space for STT approach lanes, building a new flyover for the southbound traffic from the Blackwall Tunnel to cross above the Silvertown Tunnel approach lanes and introducing new signage to direct traffic.

2. Planning

2.1 Environmental Statement

The ES covered air quality impacts during the construction and operational phases. Monitored and modelled air quality concentrations indicated that the study area is currently subject to existing poor air quality particularly for nitrogen dioxide. The conditions described are typical for the heavily urbanised environment in inner London. The construction phase air quality assessment focussed on the potential air quality impacts from construction dust, construction traffic movements (including river movements) and from the impacts of associated activities such as emissions from construction plant and machinery. Measures to minimise construction related air quality impacts are outlined within the CoCP and include wheel washing, dust monitoring and covering of lorries. The scheme has committed to transporting at least 50% (by weight) of construction related materials by river to reduce the number of lorries required. Taking into account the mitigation measures set out in the CoCP, it is anticipated that dust impacts and vehicle/plant related emissions would not be significant.

2.2 Legislation

Riverlinx CJV are committed to complying fully with all relevant legislation, regulations and codes of practice relating to the environment. The relevant legislation, standards and other requirements for air quality are found within the following;

- Silvertown Tunnel Development Consent Order (DCO)
- Silvertown Tunnel Code of Construction Practice (CoCP)
- The local authorities' requirements of local air quality management under part IV of the Environment Act 1995
- The UK Air Quality Strategy 2000, as amended
- The Mayor's Air Quality Strategy
- CIRIA 'environmental good practice on site' (C741)

3. Resources

3.1 Roles and Responsibilities

The Riverlinx CJV Project Director is responsible for the implementation of air quality management during the construction of STT. Many members of Riverlinx CJV also have responsibility for elements of air quality management appropriate to their function, experience and seniority. The Riverlinx CJV Environmental Manager will lead on air quality management and act as the key advisor on all related matters including compliance with this plan. The Environmental Manager will be supported by an air quality specialist to lead on technical matters. Air Quality specialists shall meet the minimum qualifications and experience described in Table 1 below;

Environmental specialism	Specialist's minimum qualifications and experience
Air quality	A member of the Chartered Institution for Air Quality Management with a minimum of 3 years air quality relevant experience.

Table 1 CJV Environment Team Competency

Table 2 provides details of the personnel working on the project with specific responsibilities in relation to air quality management.

Role Title	Responsibilities
Project Director	• Provide adequate environmental resources and support to effectively deliver the requirements of this plan
Environmental Manager	• Develop and implement the AQMP • Identify and maintain compliance with the requirements and principles of the AQMP during construction • Assist lead auditors in auditing the AQMP • Identify, develop and provide environmental training as required specific to the AQMP • Approve method statements and consider AQMP requirements • Advise and instruct construction teams in the event of incidents and complaints • Liaise/meet with external stakeholders
Environmental Advisors	• Inspections on compliance with the AQMP requirements • Brief AQMP requirements to relevant teams • Advise and guide project team in the implementation of air quality/dust controls • Identify ideas for improvement to environmental manager for consideration. • Report best practice across the project • Assist in incident investigations and reporting • Encourage near miss reporting and identify trends
Air Quality Specialist	• Provide technical support on air quality issues. • Undertake baseline and construction phase air quality monitoring • Assist in the investigation of any complaints or incidents as required.
Section Manager	• Ensure the specified controls within the AQMP plan are detailed in method statements. • Manage the investigation and response to complaints.
Community Liaison Manager	• Liaise with the local community regarding any complaint or query. • Notify the Section Manager and environmental team of any complaints regarding air quality. • Manage investigations into the complaints and provide the main point of contact with the helpline.

Role Title	Responsibilities
All Personnel	• Carry out the works in accordance with agreed methods and briefings. • Report anything that deviates from agreed processes. • Report all identified air quality incidents and examples of best practice to section managers • Attend environmental training.

Table 2 CJV AQMP Roles and Responsibilities

3.2 Training and Awareness

The Riverlinx CJV Environmental Team will provide training to staff and operatives at all levels (and, when appropriate, to others involved in or affected by work activities) to achieve and maintain a high standard of environmental awareness and risk control. The construction team have been involved in the development of the AQMP and briefed on its requirements and input in developing specific mitigations for planned activities where practicable. Environmental information on air quality management will be displayed in offices, site cabins and at sensitive locations around the worksite to increase awareness of specific air quality issues e.g. compliance with vehicle and emissions standards, dust mitigation etc.

All those working for or on behalf of Riverlinx CJV shall undertake an induction that includes an introduction to the key aspects of environmental management on the project including information on the Air Quality Management Plan. In addition, all Riverlinx CJV personnel will undertake an internal Environmental Awareness training session that will introduce personnel to how to manage site environment risks relevant to STT Works and provide practical guidance for specific topics including air quality. The Environmental Team, the Air Quality Specialist and the Riverlinx CJV construction team will deliver air quality themed toolbox talks to site and office teams making use of best practice materials from parent companies and organisations such as CIRIA. All vehicle and plant drivers will undertake fuel efficient driver training.

3.3 Communication

External communication on environmental matters will occur in a number of ways. The Riverlinx CJV Environmental Manager, Consents Manager and members of the Environmental Team will meet local authorities at appropriate and agreed intervals to discuss any air quality management matters. The Riverlinx CJV Community Relations representative will seek to maintain dialogue with local communities and associations by various means including the Helpdesk. Should air quality incidents occur due to CJV construction activities, Riverlinx CJV will report details to relevant authorities.

4. Operational Control

4.1 Site Control Measures

The following control measures in Table 3 below will be adopted, where appropriate and reasonably practicable, for the tasks identified;

Issue	Control measures
Communications	• Undertake community engagement activities before main works commences on site; • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary of both construction worksites; • Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and particulate matter emissions are minimised.
Site Management	• Record all dust and air quality complaints in a complaints log which may be made available to the Local Authority upon request; and • Record any exceptional incidents that cause dust/or air emissions, and the action taken to resolve the situation.
Monitoring	• Undertake on-site and off-site inspections to monitor dust; • Carry out regular site inspections to monitor compliance with the AQMP; • Increase frequency of site inspections when activities with a high potential to produce dust are being carried out; • Record inspection results in an inspection log; and • Make an inspection log available to the Local Authority upon request.
Preparing and maintaining the worksites	• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible; • Erect suitable solid screens or barriers around dusty activities or the site boundary; • Enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period; • Install green walls, screens or other green infrastructure where appropriate to minimise the impact of dust and pollution; • Avoid site runoff of water or mud; • Keep site fencing, barriers and scaffolding clean using wet methods; • Use water as dust suppressant where applicable; • Remove waste materials that have a potential to produce dust from site as soon as practicable; • Cover, seed or fence stockpiles to prevent wind whipping; • Carry out regular dust soiling checks of buildings within 100m of site boundary and cleaning to be provided if necessary; and • Provide showers and ensure a change of shoes and clothes are required before going off-site to reduce transport of dust.

Issue	Control measures
Operating Vehicle/ Machinery and Sustainable Travel	• All vehicles, mobile and fixed plant on site shall not be left running/idling unnecessarily. This requirement will be briefed to staff and checks will be performed during site inspections. • A systematic approach to plant and vehicle maintenance will be adopted to ensure that routine servicing of plant and vehicles in accordance with the manufacturer's recommendations takes place and records maintained for the work undertaken. • Maximising energy efficiency by maximising use of river transport for materials and waste, operating a vehicle booking system to ensure full loading and efficient routing. • Well maintained/low emission vehicles and equipment fitted with catalysts, diesel particulate filters or similar devices; • Avoid the use of diesel or petrol powered generators where practicable; and • Impose a maximum-speed-limit of 25kph on surfaced and 15kph on un-surfaced haul roads and work areas. • Use ultra low sulphur fuels in plant and vehicles
Operations	• Cutting equipment to use water as dust suppressant or suitable local extract ventilation; • Ensure an adequate water supply on the site for effective dust/particulate matter suppression, using recycled water where possible and appropriate; • Use enclosed chutes and covered skips; • Minimise drop heights; and • Ensure equipment is readily available on site to clean any spillages.
Waste Management	• Reuse and recycle waste to reduce dust from waste materials; and • No bonfires and burning of waste materials.
Demolition	• Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust); • Ensure water suppression is used during demolition operations; • Avoid explosive blasting, using appropriate manual or mechanical alternatives; and • Bag and remove any biological debris or damp down such material before demolition.
Earthworks and Construction	• Re-vegetate earthworks and exposed areas; • Use hessian, mulches or tackifiers where it is not possible to re-vegetate; • Only remove the cover in small areas during work and not all at once; • Avoid removing a thin layer of concrete from structures by compressed air powered machines; • Ensure sand and other aggregates are stored and not able to dry out; and • Ensure bulk cement and other fine power materials are delivered and stored to prevent escape.

Issue	Control measures
Trackout	• Use water-assisted dust sweepers on the access and local roads; • Avoid dry sweeping of large areas; • Ensure vehicles entering and leaving worksites are covered to prevent escape of materials; • Inspect on-site routes for integrity, instigate necessary repairs and record in site log book; • Install hard surfaced haul routes on site, which are regularly damped down with fixed or mobile sprinkler systems or mobile water bowsers, and regularly cleaned; • Implement a wheel washing system at a suitable location near site exit; • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; • Access gates at least 10m from receptors where possible; • Apply dust suppressants to locations where a large volume of vehicles enter and exit the construction site.

Table 3 Control Measures

4.2 Baseline Monitoring

Riverlinx CJV will undertake baseline monitoring (total suspended particles, $PM_{2.5}$ and PM_{10}) for a period of 2 weeks, approximately 3 months prior to the commencement of main construction works, at the locations shown in Figure 1 below. They will also be subject to site factors that permit Riverlinx CJV to deploy the monitors safely and securely.

The Environmental Statement (ES) does not identify any significant impacts on air quality from construction, once mitigation is put in place. The activities on site that will therefore benefit from air quality monitoring are demolition and earthworks. We therefore suggest that the air quality monitoring focuses on dust impacts from these, monitoring of total suspended particles, PM_{10} and $PM_{2.5}$. In consideration of possible receptors, prevailing winds and the currently proposed location of demolition activities and earthwork stockpiles the following two baseline air quality monitoring locations shall be undertaken at Silvertown:

Mace Site Compound – This baseline air quality monitoring location is proposed within the Mace site compound or on the roof of the site cabins at the eastern end of Edmund Halley Way.

The O2 Car Parking Office – This baseline air quality monitoring location is proposed on the roof of The O2 Car Parking Office which is a single storey building located adjacent to the roundabout on Edmund Halley Way.

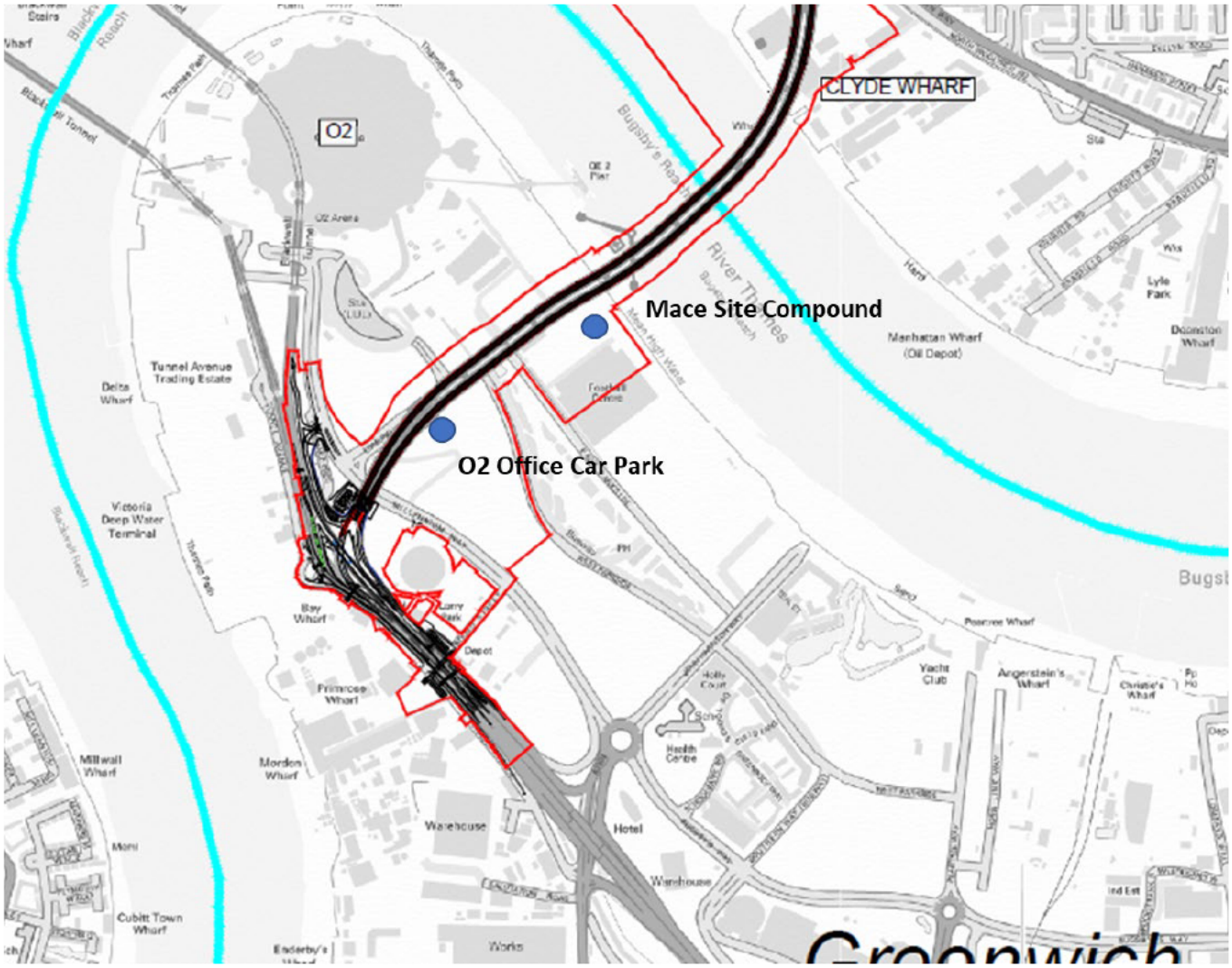

Figure 1 Baseline Air Quality Monitoring Locations – Greenwich

4.3 Vehicle and Plant Emissions

All delivery vehicles will comply with the London Low Emission Zone (see http://lruc.content.tfl.gov.uk/ulez-lez-comparison-table.pdf.pdf). All construction vehicles will be Euro 6 unless otherwise agreed with the GLA or Royal Borough of Greenwich. All non-road mobile machinery (NRMM) will comply with the following standards, in Table 4 below, set within the Greater London Authority's Control of Dust and Emissions During Construction and Demolition Supplementary Planning Guidance (2014). The requirements are for all NRMM of net power 37 kW to 560 kW and relate to EU Directive 97/68/EC (Directive 97/68/EC of the European Parliament and of the Council, 1997) and its subsequent amendments as a minimum. Any departures required from the above guidance will only occur in exceptional circumstances (e.g. for specialised plant intended for short duration use such as heavy lift cranes) and will be discussed with the Local Authority in every instance.

From 1st September 2015	From 1st September 2020
Stage IIIA	Stage IIIB

Table 4 NRMM Emission Standards

4.4 Odour

In the event of exposing potentially contaminated material that could contain volatiles that may have a bad smell, Riverlinx CJV will adopt the following measures to ensure that there is no significant effect on local residents;

- Contaminated and non-contaminated materials will be stockpiled separately following excavation;
- Early identification of contaminated material which could generate an odour issue;
- Covering up of any odorous materials;
- Locating contaminated materials as far away from residential receptors as possible; and
- Ensuring odorous material is prioritised for removal from the worksites.

5. Checking

5.1 Compliance Checks

During the construction phase Riverlinx CJV will monitor of the effectiveness of the AQMP. This will be undertaken by the Environmental Team and Section Managers and will include inspections and audits to confirm compliance with the plan. Any non-conformances will be addressed, and further action will be taken where deemed appropriate. Environmental incidents will be recorded, and near miss reporting will be encouraged through the use of observation cards which will assist with identifying trends and any need for additional training.

5.2 Dust and Particulate Monitoring

Air quality monitoring will be undertaken for the duration of the construction works and will comprise of unattended (semi-permanent) PM_{10} monitoring units. The CJV proposed locations for the air quality monitoring units during construction are as per the baseline positions, outlined above within section 4.2. Any proposed changes to these locations (e.g. should it be identified that more representative monitoring locations could be used for particular phases of the construction activities) will first be discussed with the Local Authority. Subject to higher baseline levels being recorded, Riverlinx CJV will adopt a trigger level of 250 ug m-3 set as a 15-minute mean for concentrations of PM_{10}. If this level is exceeded, an alert will be sent to members of the Environment Team and Site Team to advise them of the elevated levels. Personnel on site will conduct a walkover of the site activities nearest to the monitor which has sent the alert. If an observable cause can be identified, an onsite a review of the mitigation will be undertaken and necessary amendments made as soon as practicable. If no observable cause can be identified the site personnel will walk the perimeter of the site nearest the monitor and attempt to identify another cause. The outcomes of these checks/observations will be passed on to the Environmental Manager to form part of an investigation. The relevant local authority will be informed of the exceedance and be advised on the immediate investigation and corrective action where applicable.

5.3 Reporting

Air quality data/information will be collated each month. This data will be subjected to a verification check by the air quality specialist to confirm that it is valid. The information will:

- Describe air quality equipment including serial numbers and dates of last calibration
- Include dates and results of field calibration checks within the reporting period
- Provide commentary on weather conditions and any data excluded due to unsuitable weather conditions and/or any uncertainty in the results due to weather related interference
- Summarise measured PM_{10} and dust levels over the reporting period
- Include data provided in a graph format where possible
- Identify any threshold exceedances and provide a summary from the investigation undertaken.
- Air quality related complaints and details of the investigation.

The air quality data/information will be made available to the Royal Borough of Greenwich for any period upon request. Investigations will be conducted in the event of any threshold exceedance. The investigation will look into whether site activities at the time were being conducted with suitable mitigation measures in place and the immediate actions taken where applicable. In the event of an air quality complaint Riverlinx CJV will undertake an investigation to review the air quality monitoring results to determine whether elevated PM_{10} levels were captured by one of the unattended monitors or whether a particular site activity may have been conducted without appropriate mitigation measures in place. Riverlinx CJV will report back on findings to the complainant.

5.4 Review

The Environmental Manager will meet with senior team members, including the Project Director, Quality Manager, and Engineering Manager for formal management reviews. The review will include specific focus on the Air Quality Management Plan. At the management reviews, improvement plans and related actions will be developed if required. The Environmental Manager will issue all review attendees with a report including the following items before the meeting:

- Adequacy of environmental resourcing
- Training undertaken and planned
- Analysis of site inspections, audits, incidents and non-conformities
- Analysis of monitoring
- Recurring issues and time taken to complete actions
- Follow-up actions from previous management review
- Recommendations for improvement.