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Addendum 2 to Environmental Impact Report

Addendum Date:	May 2, 2014
Case No.:	2007.0946E
Project Title:	Candlestick Point-Hunters Point Shipyard Phase II
EIR:	2007.0946E, certified June 3, 2010
Project Sponsor:	CP Development Co., LP
Lead Agency:	San Francisco Planning Department/Office of Community Investment & Infrastructure
Staff Contact:	Joy Navarrete – (415) 575-9040 joy.navarrete@sfgov.org

REMARKS

Background

On June 3, 2010, the San Francisco Planning Commission and the Redevelopment Agency Commission certified the Final Environmental Impact Report (FEIR) for the Candlestick Point – Hunters Point Shipyard Phase II Project (Project), San Francisco Planning Department file number 2007.0946E and San Francisco Redevelopment Agency file number ER06.05.07.

On July 14, 2010, the San Francisco Board of Supervisors affirmed the Planning Commission's certification of the Final EIR (Motion No. M10-110) and adopted findings of fact, evaluation of mitigation measures and alternatives, and a statement of overriding considerations (File No. 100572) and adopted a Mitigation Monitoring and Reporting Program (MMRP) in fulfillment of the requirements of the California Environmental Quality Act (CEQA). The Project is the integrated redevelopment of 702 acres in the Candlestick Point area and the Hunters Point Shipyard Phase II area with a major mixed-use project including open space, housing, commercial (office, regional retail, and neighborhood retail) uses, research and development, artist space, a marina, new infrastructure, community uses, entertainment venues, and a new football stadium.

Between June 3, 2010 through August 3, 2010, the Planning Commission, Redevelopment Agency, Board of Supervisors, and other City Boards and Commissions adopted various resolutions, motions and ordinances relating the Project approval and implementation, including but not limited to: (1) General Plan amendments; (2) Planning Code amendments; (3) Zoning Map amendments; (4) Bayview Hunters Point Redevelopment Plan amendments; (5) Hunters Point Shipyard Redevelopment Plan amendments; (6) Interagency Cooperation Agreements; (7) Design for Development (D4D) documents; (8) Health Code, Public Works Code, Building Code, and Subdivision Code amendments; (9) Disposition and Development Agreement, which included (among other documents) as attachments a Project Phasing Schedule, a Transportation Plan, and an Infrastructure Plan; (10) Real Property Transfer Agreement; (11) Public Trust Exchange Agreement; (12) Park Reconfiguration Agreement; and (13) Tax Increment Allocation Pledge Agreement.

Subsequent to the certification of the EIR and the approvals listed above, on January 7, 2014 the Commission on Community Investment & Infrastructure (former Redevelopment Agency) approved the first Major Phase and Sub-Phase applications for the Project which included changes to the Project Phasing Schedule and corresponding changes to the Transportation Plan, Infrastructure Plan, public benefits, and certain mitigation measures. Addendum 1 to the FEIR, published on December 11, 2013, was prepared to evaluate these changes. The project sponsor now proposes to implement the Automatic Waste Collection System described in the FEIR as part of Utility Variant 4.

Project Summary

The Project covers approximately 702 acres along the southeastern waterfront of San Francisco consisting of 281 acres at Candlestick Point (Candlestick) and 421 acres at Hunters Point Shipyard (HPS Phase II). The Final EIR evaluated the Project described in Chapter II and several Variants. The Board of

Supervisors approved several development options, including the Project with the stadium and two non-stadium variants. Specifically, the Board approved: (1) the Project with a stadium as described in Chapter II of the Final EIR with the Candlestick Tower Variant 3D, Utility Variant 4, and Shared Stadium Variant 5; (2) the Project without the stadium plus the R&D Variant 1, the Candlestick Tower Variant 3D, and the Utility Variant 4; (3) the Project without the stadium plus the Housing/R&D Variant 2a, the Candlestick Tower Variant 3D, and the Utility Variant 4; and (4) Sub-alternative 4A, which provides for the preservation of four historic structures located in the Hunters Point Shipyard and which could be implemented with either the stadium Project or non-stadium Variants. (See, Board of Supervisors CEQA Findings pp. 2-4)

The Major Phase 1 and Sub-Phase applications approved on January 7, 2014 implement the non-stadium Project with the Housing/R&D Variant 2a, including the Candlestick Tower Variant D. At the time of that approval, no decision had been made with respect to implementing the Utility Variant 4 and it was not discussed in Addendum 1.

As described above, the Final EIR analyzed and the Board of Supervisors approved Variant 4: Utilities Variant, which included the Automate Trash Collection System. The Variant would provide an automated trash collection system, which would transport trash from individual buildings and collection points and transfer it, via underground pneumatic tubes, to a centralized collection facility, from which solid waste, recyclable materials, and compostable materials would be removed via trucks. This automated system would replace the trash and recycling bins at individual buildings with two centralized facilities, one in Candlestick Point and another at Hunters Point.

Proposed Revisions to Project

Subsequent to the Final EIR, the project sponsor has provided additional design and operational detail for the proposed Automated Waste Collection System (AWCS) and a second location for a central collection facility has been added in the Hunters Point Shipyard area. This Addendum 2 will evaluate the proposed implementation of the Automated Waste Collection System (AWCS) in Candlestick Point and Hunter's Point Shipyard included as one of the three utility infrastructure options analyzed in Utility Variant 4 in the context of the analysis included in Section IV.E of the FEIR and Appendix T3. The system will be designed, permitted, constructed, maintained and operated by TransVac in partnership with Recology. All of these changes are discussed below.

The TransVac AWCS is a solid waste collection system that uses underground pipes and pressurized air to transport streams of municipal solid waste (including recycling and compostable material) from multiple indoor and outdoor waste inlets to enclosed centralized waste collection facilities. The AWCS greatly reduces the need for door-to-door waste collection. As shown in the figure below, the AWCS consists of three separate parts: inlet points, pipe network, and a central collection facility.[1]

[1] There will be a total of three (3) Central Collection Facilities in the AWCS. One will be located in the Candlestick Point portion of the Project Site, and two (2) will be located in the Hunters Shipyard area of Project Site. See text and graphics at p. 4, supra.

Once the waste is deposited into the system through the inlets, it drops into a sealed chamber located below the inlets which holds the material in place until an electronically controlled valve opens and drops the material into the horizontal underground transport pipe network. After the waste drops into the pipe, the valve closes and powerful electric fans create air pressure which propels the waste at high speed through a sealed network of underground pipes to enclosed compactors and waste containers at a centralized collection facility. Once the waste is placed in an inlet it will neither be seen nor handled again until it is unloaded from collection trucks that will pick up the waste at each collection facility and take the waste to Recology's solid waste and recycling facilities at Tunnel and Beatty Roads and Pier 96. The holding chambers will be emptied at least once every 8 hours.

The first of the three central collection facilities to be built will be sited on top of the parking garage at the Candlestick Point Retail Center (CP Center). It will be located at street level and accessed by a separate entrance from the garage. This collection facility will be approximately 6,300 square feet. The building will range in height from 16 feet to 36 feet and would comply with the height, setback and bulk requirements in the Design for Development Program under the 65-foot height limit in Candlestick Point. The other two central collection facilities will be located at Hunters Point Shipyard along Crisp Road, and on Spear Avenue near B Street. Both locations are in areas designated for Research and Development activities. Collection facilities at both locations would range from 16 feet to 36 feet, and would similarly comply with the Design for Development requirements under their respective height limits of 65 and 85 feet.

The main network of underground pipe is comprised of 20-inch inside diameter heavy gauge steel pipe that is welded, poly-wrapped and buried within the street rights-of way pursuant to a Major Encroachment Permit approved by the Board of Supervisors. The thicknesses of the pipe will vary from 3/8-inch to 1-inch based on pipe layout geometry of branches and bends.

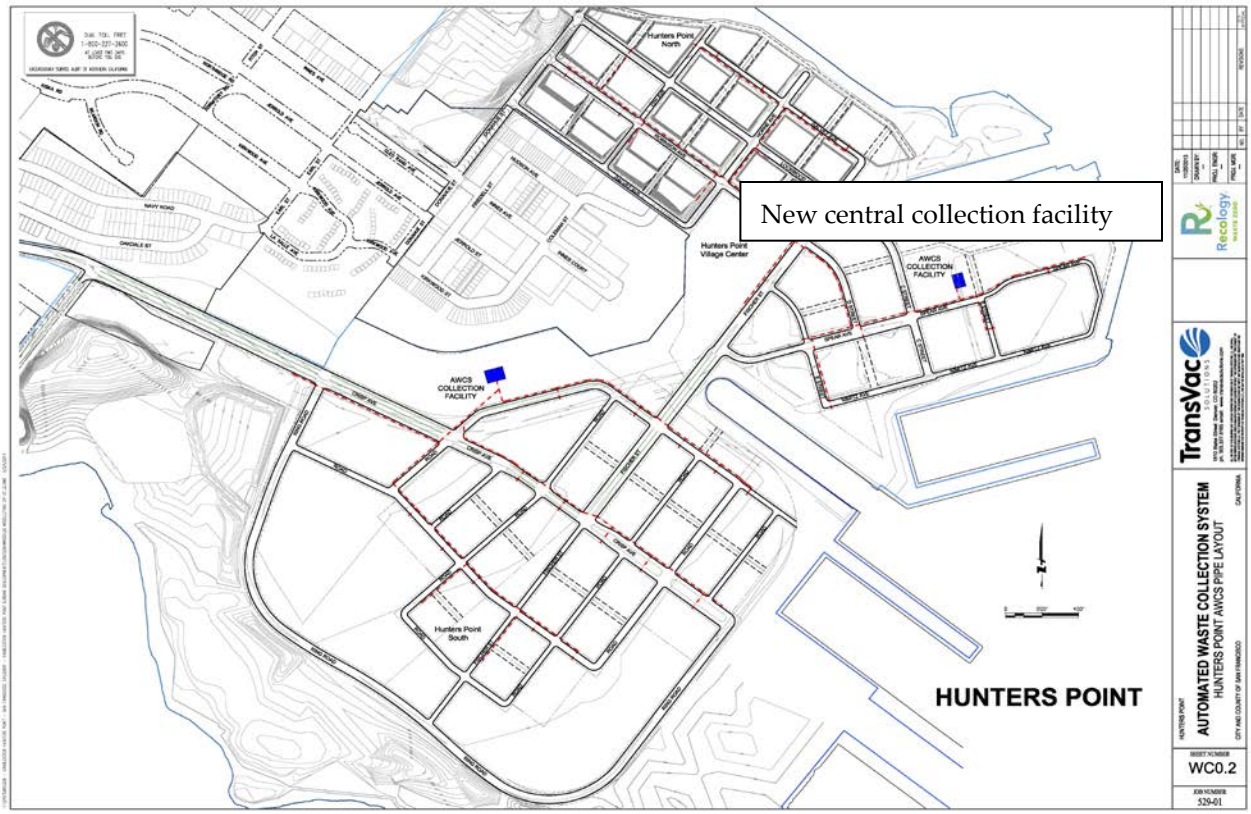
Permits

Recology will notify the SFDPH in its role as LEA under CalRecycle prior to commencing AWCS operations.

AWCS Approvals

Board of Supervisors - Major Encroachment Permit
Department of Public Works - Subdivision Map and Excavation Permits
Department of Building Inspection - Building Permits
Planning Department – General Plan Referral

Other possible permits or regulatory requirements to be evaluated by the applicable agencies include the need for an air quality permit from BAAQMD, and the applicability of CalRecycle's Solid Waste Regulatory Tier program to the AWCS.


New central collection facility
Hunters Point North
Hunters Point Village Center
AWCS COLLECTION FACILITY
AWCS COLLECTION FACILITY
Hunters Point South
HUNTERS POINT
TransVac
AUTOMATED WASTE COLLECTION SYSTEM
HUNTERS POINT AWCS PIPE LAYOUT
WC0.2
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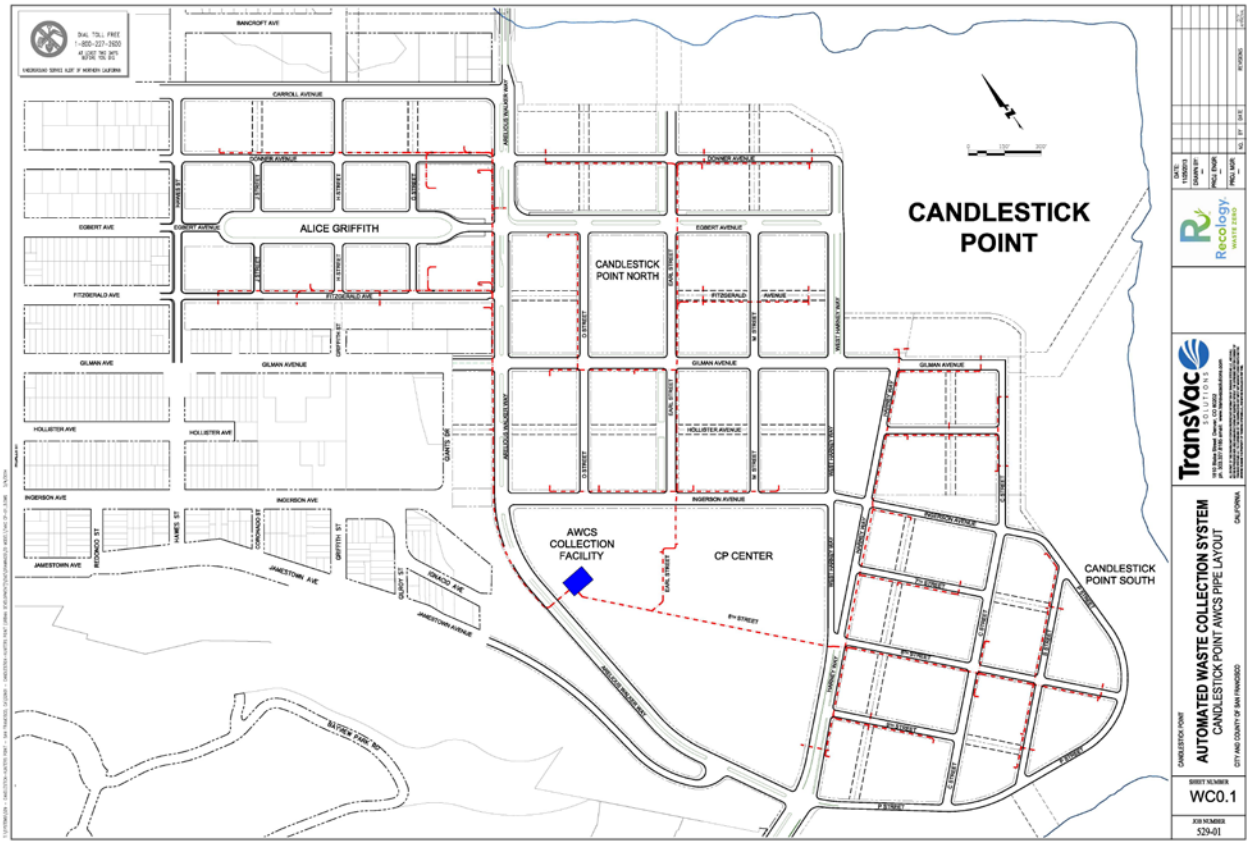
ALICE GRIFFITH
CANDLESTICK POINT NORTH
CANDLESTICK POINT
AWCS COLLECTION FACILITY
CP CENTER
CANDLESTICK POINT SOUTH
TransVac
AUTOMATED WASTE COLLECTION SYSTEM
CANDLESTICK POINT AWCS PIPE LAYOUT
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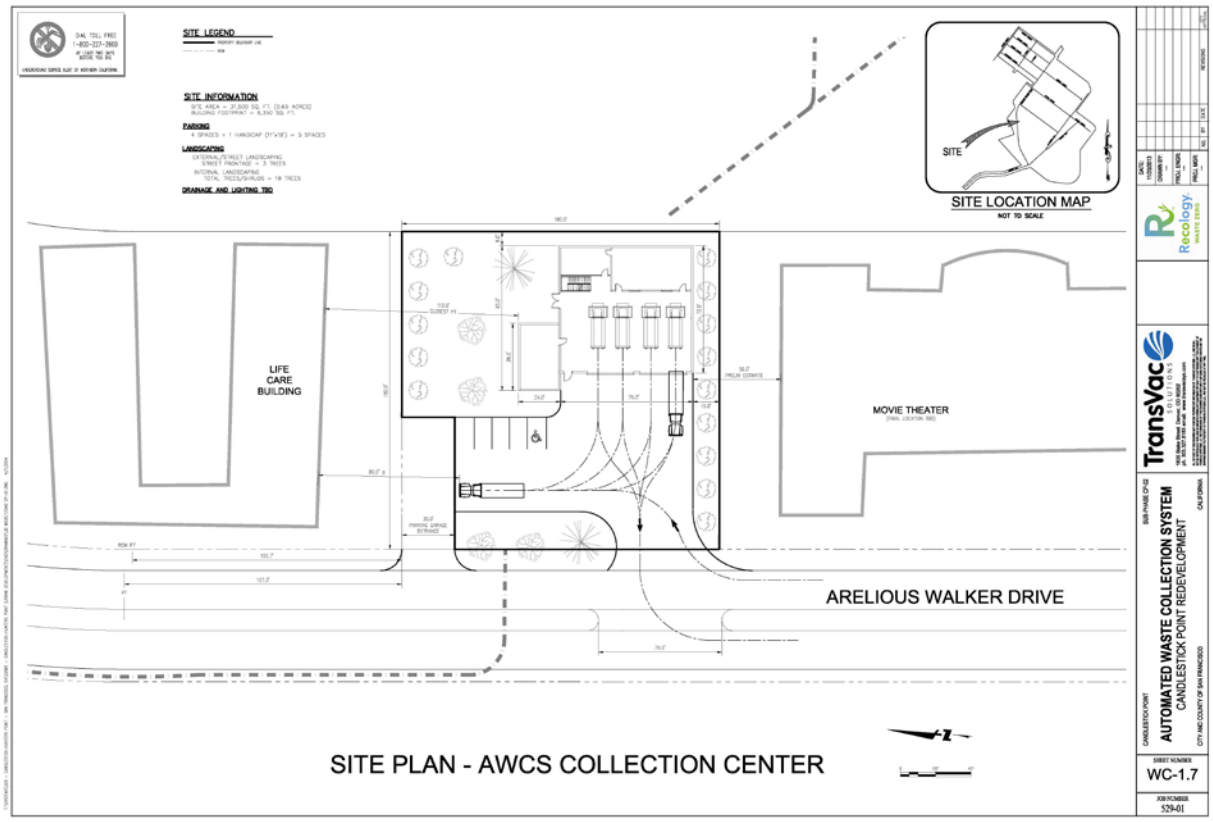

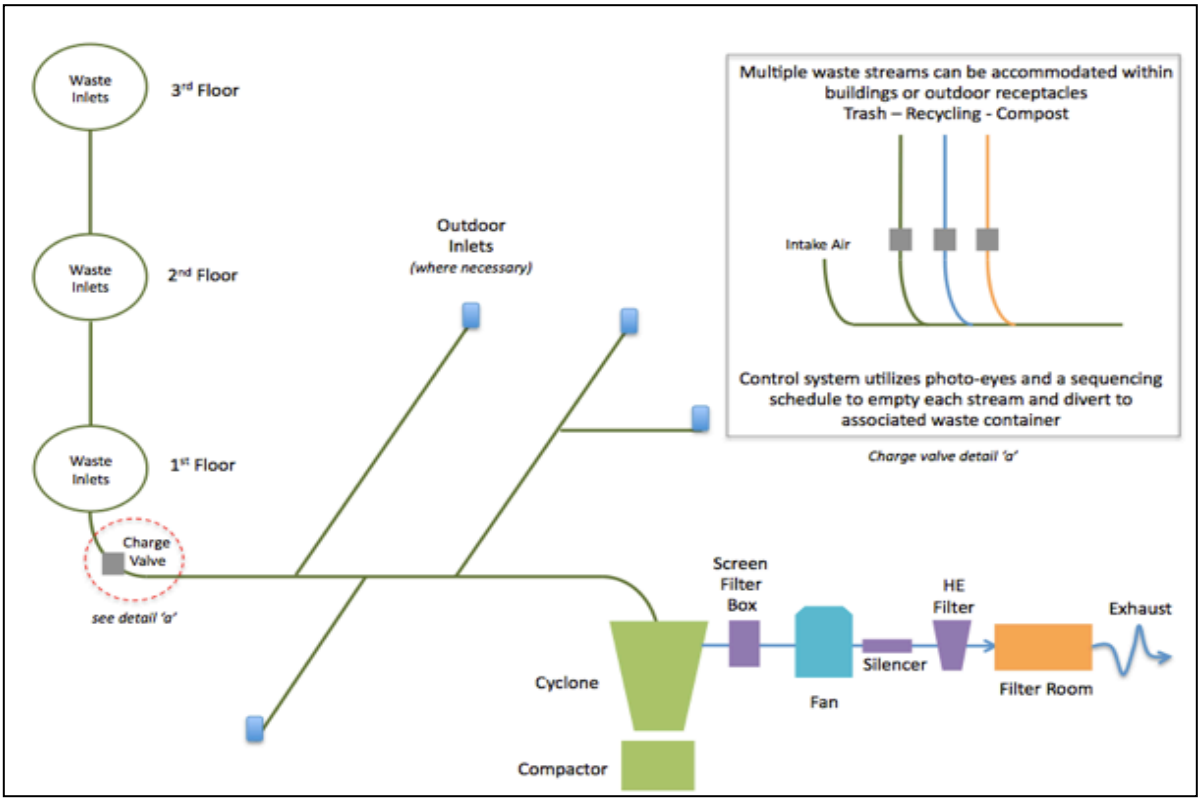

BASIC SCHEMATIC OF AWCS

Analysis of Potential Environmental Effects

Land Use and Plans

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant land use and plans impacts and no mitigation measures were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not result in any land use changes or the introduction of a new land use. The Hunters Point central collection facilities would be located in areas designated for Research and Development uses, where the collection facilities are permitted uses. The Candlestick Point central collection facility would be located in the regional shopping center garage, as proposed in the FEIR, where it is a permitted use. As explained in the project description, at this location, the facility will be on the roof of an underground garage, accessed at street level, with its own entrance. At all locations, the collection facilities will comply with applicable height, setback, bulk and other land use controls applicable to the sites. The proposed AWCS would not result in changes to the Project land use patterns, would not increase the Project density or intensity, and would not raise any new land use issues under the FEIR significance criteria. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to land use and plans impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's land use and plans impact findings.

Population, Housing and Employment

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant population, housing and employment impacts and no mitigation measures were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR findings, because the AWSC would not affect population projections or housing conditions. The additional central collection facility may slightly increase construction employment, but given the small size of the facility any such increase would be insubstantial in the context of the construction employment assumed for the Project. Additionally, the FEIR assumed development would occur on the sites proposed for the central collection facilities. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to population, housing and employment impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's population, housing and employment impact findings.

Transportation and Circulation

The traffic generation forecasts prepared in the FEIR included trips generated by various services associated with new development, including trash services, based on typical conditions when trash is collected throughout the site at individual buildings. Therefore, consolidation of the trash collection operations at three centralized locations may slightly increase the number of truck trips to those locations, but would also slightly reduce the traffic levels throughout the rest of the project because trucks would

no longer have to circulate through the site to individual buildings. The change in traffic volumes at any given location would likely be no more than one or two truck trips per hour, which would be negligible.

The roadways within the project site, specifically Harney Way and Arelious Walker Drive, within Candlestick Point, and Cargo Way, Jennings Street, Evans Avenue, Innes Avenue, Donahue Street, Lockwood Avenue, Fischer Street and Speer Street in the Hunters Point Shipyard area, have been designed to accommodate 40-foot trucks similar to those operated as part of the proposed automated waste collection system. Therefore, trucks should be able to safely maneuver within the project area.

The location of the collection facility driveways would conform to the design criteria described in the D4D documents for the CP-HPS Project and would therefore conform with reasonable design standards. Therefore, the design of the roadway network and the location of the driveways would be consistent and compatible with the proposed circulation of trucks to and from the collection sites.

Thus, the effects of locating the AWCS central collection facilities at the proposed locations would not change any of the traffic or circulation impact conclusions in the FEIR or require any new mitigation measures. See **Appendix A**. Construction of the AWCS facilities would be subject to compliance with the construction traffic management program required by MM TR-1. Additionally, there are no changed circumstances or new information that would change the FEIR's traffic and circulation impact findings.

Aesthetics

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant aesthetic impacts and mitigation measures were required for construction and light and glare impacts. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR findings because: (1) the AWCS central collection facilities are located on sites where development was anticipated and analyzed in the FEIR and they would comply with all applicable land use controls; (2) a significant portion of the AWCS would be located underground; (3) the central collection facilities in Hunters Point would be sited on the development lot so that the structures may be partially or fully screened from the street by other buildings; (4) the building will be designed in accordance with the D4D;(5) the AWCS would eliminate the need for unsightly trash dumpsters, which would otherwise be located throughout the Project development areas; and (6) the applicable mitigation measures would be implemented. Applicable mitigation measures include MM AE-2 for construction visual impacts, MM AE-7a.1 -7a3 for lighting requirements, and MM AE-7a.4 for glare impacts. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to aesthetic impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's aesthetic impact findings.

Shadow

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant shadow impacts and no mitigation measures were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional

central collection facility in Hunters Point, would not change the FEIR findings because: (1) much of the system (transport piping) would be located underground; (2) the structures for the central collection facilities would be approximately 16-36 feet in height in areas zoned for heights between 65-85 feet and consequently would not cast any significant shadows beyond those analyzed in the FEIR; and (3) the central collection facilities would be constructed in areas where development was anticipated and analyzed. As explained in the project description, at the Candlestick Point location, the facility will be on the roof of an underground garage, accessed at street level, with its own entrance. At all locations, the collection facilities will comply with applicable height, setback, bulk and other land use controls applicable to the sites. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to shadow impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's shadow impact findings.

Wind

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant wind impacts and mitigation measures for buildings over 100 feet in height were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR findings because: (1) much of the system (transport piping) would be located underground; (2) the central collection facilities would be constructed in areas where development was anticipated and analyzed; and (3) the structures for the central collection facilities would be approximately 16-36 feet in height in areas zoned for heights between 65-85 feet and consequently would not create the potential for significant wind impacts beyond those analyzed in the FEIR. . As explained in the project description, at the Candlestick Point location, the facility will be on the roof of an underground garage, accessed at street level, with its own entrance. At all locations, the collection facilities will comply with applicable height, setback, bulk and other land use controls applicable to the sites. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to wind impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's wind impact findings.

Air Quality

Construction Emissions

The FEIR evaluated three construction related air quality impacts: *Impact AQ-1: Criteria Pollutants (Construction)*, *Impact AQ-2: DPM from Construction Activities*, and *Impact AQ-3: TACs from Construction Activities*. The construction activity data that was used to estimate emissions included construction in the areas where the facilities will be located. The construction HRA in the FEIR also included construction activities and construction emission sources in these locations. Thus, the construction impacts of the ACWS were included in the FEIR analysis. Consequently, the findings of the FEIR for *Impact AQ-1: Criteria Pollutants (Construction), AQ-2: DPM from Construction Activities*, and *Impact AQ-3: TACs from Construction Activities* would not change based on the additional detail now available for the AWCS. Construction of the AWCS would comply with MM AQ 2.1 for construction emissions.

Operational Emissions

The FEIR evaluated operational emissions in *Impact AQ-4: Criteria Pollutants (Operational)* and *Impact AQ-5: Carbon Monoxide*. The FEIR included an analysis of criteria air pollutants (CAP) emissions from 78,109 daily external motor vehicle trips and area sources such as natural gas combustion, maintenance equipment, and consumer product use. Implementation of the AWCS would result in CAP emissions from truck travel and PM emissions from the exhaust of the AWCS Facilities.

In the FEIR, the emissions from the 78,109 trips were estimated using URBEMIS, which assumes a standard mix of vehicle types for the city/county. This mix would include both heavy trucks and passenger cars. The mix of vehicles for the city/county includes vehicles used for all types of trips, including waste pick up.

With implementation of the AWCS, the total quantity of vehicle miles traveled by garbage trucks throughout the Project would be significantly reduced. Each facility would have approximately 14 one way daily truck trips (7 trucks to and from each central collection facility), resulting in 21 daily round truck trips which go directly to and from each central collection facility rather than from building to building throughout the Project. Thus, emissions from the truck trips associated with the AWCS were fully accounted for in the FEIR and actual truck trip emissions with implementation of the AWCS would be lower than estimated in the FEIR due to the AWCS reduced truck miles traveled.

Emissions from the exhaust of the AWCS central collection facilities are expected to be minimal due to the design of the multi-stage dry filtering system. In an effort to further minimize emissions from the facilities, the air filtration system will be designed to meet the Bay Area Air Quality Management District's (BAAQMD) Best Available Control Technology (BACT) for solid material storage – Enclosed.[2] While BAAQMD has not determined the applicability of its BACT regulations to this facility, Environ has determined that this category is the most similar representative category as reported in the BAAQMD BACT handbook. See **Appendix B**. The BACT limit is 0.01 grains per dry standard cubic foot (gr/dscf). Given this emission rate and the exhaust rate of the system, emissions for solid material storage would be 27.2 pounds per day (lb/day) or 4.96 tons PM_{10} per year for one facility, as shown in Table 2. A source test may show that actual emissions from the AWCS may be much lower. Once the AWCS is operational, Recology will conduct initial testing of exhaust air for PM10 emissions to ensure the emissions do not exceed the estimated rate of 27.2 lbs/day in Table 2. Recology will also develop an Operation Plan for the AWCS which will include a periodic monitoring schedule for testing air emissions from the AWCS. Recology will notify SFDPH in its oversight role as LEA under CalRecycle prior to commencing AWCS operations. Testing results will be submitted to the LEA within 30 days of receipt of final testing results.

[2] BAAQMD.BACT Guideline. Section 11, Miscellaneous Sources, Solid Material Storage – Enclosed. Doc. #1571.1 (10/18/91). Available at: http://hank.baaqmd.gov/pmt/bactworkbook/default.htm.

Table 2
Estimated PM_{10} Emissions from Discharge of one Facility

Emissions	Flow Rate	Emissions	
gr/dscf	scf/min	lb/day	tons/year
0.01	13,200	27.2	4.96

The FEIR determined that Impact AQ-4 was significant and unavoidable. The FEIR estimated PM10 emissions from the 2010 Project to be 1490 lb/day. Assuming the emissions in Table 2 from the discharge at each of the three collection facilities, calculated PM_{10} emissions for the Project would increase approximately 6% overall. However, the reduced truck travel distances associated with the AWCS would also decrease PM_{10} emissions, such that a net increase of PM_{10} emissions, assuming the Table 2 levels, would be less than 6% of that total. Such a change in the project emissions would not change the conclusions of *Impact AQ-4: Criteria Pollutants (Operational).* Further, the conclusions related to *Impact AQ-5: Carbon Monoxide (less than significant)* would not change based on the additional detail now available for the AWCS. The AWCS is an all-electric system and thus no carbon monoxide emissions are generated and the AWCS reduces truck travel.

Health Impact of Operation of the Facilities
The FEIR evaluated the concentrations of TACs from operation of Research and Development uses in *Impact AQ-6: Toxic Air Contaminants*. The AWCS will not accept any hazardous waste or other sources of TACs. While TACs may be associated with waste, the waste will be stored at the collection facilities for a less than a day and hence would not be expected to break down and emit TACs. Furthermore, any decay of materials will occur within the enclosed containers ensuring that TACs will not be emitted into the environment at any appreciable quantities. Thus, the AWCS would not change the findings of *Impact AQ-6: Toxic Air Contaminants (less than significant with mitigation).*

Impact AQ-7: Traffic $PM_{2.5}$ evaluated the impact of vehicular traffic on $PM_{2.5}$ concentrations. The operation of the AWCS would result in $PM_{2.5}$ emissions from trucks transporting the waste offsite. Seven trucks per day are expected to come to each of the three collection centers to collect the waste and transport it to the Recology Transfer Station at Tunnel Road or the recycling facility at Pier 96. The FEIR evaluated the $PM_{2.5}$ concentration attributable to emissions from vehicles on surface streets in the Candlestick Point and Hunters Point Shipyard area as a result of the Candlestick Point-Hunters Point Shipyard Phase II Development in accordance with San Francisco's Article 38. Several roads were analyzed, including Third Street, Harney Way, and Evans Avenue. Article 38 focuses on $PM_{2.5}$ concentration as opposed to other chemicals of concern. While $PM_{2.5}$ is not the only pollutant of concern, the FEIR states that "the threshold concentration of $PM_{2.5}$ is meant to serve as a health-protective 'proxy' or surrogate for pollutant exposure from vehicles."

Different types and sizes of vehicles emit air pollutants in different amounts. When determining the emissions from this traffic, a mix of vehicles was assumed. This "fleet mix" was determined using ratios of vehicle miles travelled by vehicle class reported in California Air Resources Board's Emission Factor Model (EMFAC), and thus it includes a certain percentage of trucks. Based on the traffic volume from the transportation analysis and percent of trucks from EMFAC, the Article 38 analysis assumed over 500

trucks per day on the roads analyzed, depending on the road. The estimate of truck traffic in EMFAC is based on projections of all types of truck traffic, which includes truck travel associated with a traditional waste collection system. Thus, by using EMFAC's fleet mix, the previous analysis would have included truck travel associated with a traditional waste collection system. The AWCS would decrease the truck travel on the main roads due to the larger capacity of the trucks associated with the AWCS and would virtually eliminate travel of waste collection trucks on small residential roads. Thus, the impacts of the seven trucks (14 one-way trips) associated with each of the central collection facilities were included in the Article 38 analysis and the additional detail now available for the AWCS would not change the conclusions of *Impact AQ-7: Traffic $PM_{2.5}$ (less than significant).*

Odors

Odors have not been an issue at any other AWCS site due to the odor-reducing design of the AWCS. The design of the AWCS has four characteristics which substantially minimize the potential for waste-related odor:

1.) Waste deposited in the inlets is transported to sealed waste containers in a matter of hours, minimizing waste storage time in buildings where odors could collect;

2.) Waste inlet storage chutes and chambers are under slight negative pressure so odors cannot escape through inlets into buildings;

3.) Most waste deposited in the inlets will be contained within plastic or compostable bags throughout the entire AWCS process; and

4.) The volume of air passing through the transport system substantially reduces potential odor sources.

Air inlets are not anticipated to be a source of odor. As further described in the Odor Management Plan, waste does not come into contact with the ambient environment which reduces the potential for odors to escape from the system. Even when the system is idle, there is negative pressure in the system, which further limits the potential for odors to be released. See **Appendix B**

Recology and TransVac have prepared an Odor Management Plan ("Odor Plan") that addresses TransVac management practices such as maintenance requirements and "best practices" for operational personnel related to odor issues. (See attached Odor Plan.)

Impact AQ-8: Odors states that "there may be some potential for small-scale, localized odor issues to emerge around project sources such as solid waste collection, food preparation, etc." The FEIR found the effects "would be resolved by interventions after receipt of any complaints" and would be less-than-significant.

Recent BAAQMD guidance recommends reviewing odor complaints for similar facilities in the area to determine odor impacts of the proposed facility.[3] While there are no similar AWCS facilities nearby, TransVac has built and operated other similar facilities, most near hospitals. TransVac representatives report that TransVac has received no odor complaints from these facilities. Furthermore, to observe the

[3] BAAQMD. 2012 CEQA Air Quality Guidelines. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en

odor conditions at a similar TransVac facility, ENVIRON visited the facility at the Swedish Hospital near Seattle, Washington. The site visit occurred during normal operating hours and conditions and when waste was emptying into the compactor. ENVIRON staff did not experience any odors at the site.

Furthermore, the features of the AWCS substantially minimize odor compared with a conventional waste collection system. With the AWCS, waste is deposited through inlets, drops into a hold chamber, and is held in place until a valve opens and allows the material to drop into the horizontal underground transport pipe network. The valve closes immediately after waste drops into the pipe network. This network is sealed throughout the system, and any potential odor is contained within the piping network. As noted above, waste held in the chamber will be emptied at least every 8 hours. Should the holding chambers fill up prior to the next scheduled time, a photo detector will automatically trigger the emptying of the chamber. In conventional waste collection systems, waste may be stored in trash containers inside buildings, outside residential units, or at curbside for up to 7 days prior to collection, resulting in odor where people live and work. The longer waste is allowed to molder the greater the potential for odors. The AWCS would reduce the time waste is stored in building holding chambers to 8 hours or less. Furthermore, the AWCS is always under negative pressure so there is no buildup of odors.

The AWCS concentrates waste collection and the potential for odors to the three AWCS central collection facilities, but the potential for odors at the facilities might be less than the odors collected at any individual site in a conventional waste collection system. The lids to containers in a conventional waste collection system may be left open or ajar, allowing odors to be released which is especially problematic during warm weather. The AWCS eliminates these sources of odors by eliminating individual cans and keeping waste enclosed. Even at the central collection facilities, the waste would be enclosed. Waste transported through the sealed pipe network travels to a cyclone separator and a waste compactor, which compresses the waste into sealed metal transport containers. When an AWCS waste container is full it is disconnected from the compactor and transported by truck to a waste disposal or recycling facility. The waste would be stored at the site for less than a day, compared with waste left for up to 7 days at residences and commercial properties in a conventional system.

Odor has not been an issue at the existing known AWCS facilities, presumably due to features incorporated into the design. The only odiferous air that vents to the atmosphere is the discharge of the network of pipes. Before this air is discharged to the environment, the air is separated from waste with the cyclonic separator, and flows through a filter room. Due to the sheer volume of air needed to pull the waste through the system to the central collection facilities, odors are expected to be diluted before even receiving treatment. Air inlets will be located in the piping system in the streets and will occur throughout the community. These tend to be located upstream of waste inlets. Odors are not expected to be released from these inlets because the system is kept at negative pressure. In the event of a power outage, air could be present in the vents, but such a situation would be temporary and rare. Further, the system could be evacuated to remove waste if necessary and eliminate any collection of odors

Nonetheless, to reduce the potential for complaints and small-scale, localized odor issues, Recology and TransVac have prepared and would comply with an Odor Management Plan. This plan uses CalRecycle's

Sample Odor Impact Minimization Plan[4,5] as a guide for addressing odors. The Odor Plan, which is included as Attachment A of this document, outlines an odor monitor protocol, odor complaint response protocol, and describes the odor management measures.

Due to the design of the facilities, AWCS would not change the conclusion of *Impact 8: Odors (less than significant)*. Further, Recology would manage the AWCS to minimize odors and address odor complaints if any, in compliance with the Odor Management Plan. Finally, the LEA for solid waste facilities has the authority to ensure that odor complaints, if any, are adequately addressed by Recology.

Regional Air Plans

Impact AQ-9: Consistency with Regional Air Plans compares the Project with the *Bay Area 2005 Ozone Strategy* and the *2009 Clean Air Plan*. The review of both plans focused on transportation and the need for smart growth. The AWCS is consistent with reduced transportation and smart growth strategies because the system takes heavy duty waste collection trucks off of neighborhood roads and reduces the total amount of truck miles driven. Thus, the AWCS would not conflict with the findings of *Impact AQ-9: Consistency with Regional Air Plans (less than significant).*

Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to air quality impacts and would not require any new mitigation measures. Construction of the AWCS would be subject to MM AQ-2.1 requiring the use of emission control devices on construction equipment. Additionally, there are no changed circumstances or new information that would change the FEIR's air quality impact findings.

Noise and Vibration

At the bottom of the chute in buildings there will be some noise from air intakes, but substantially less than is typical in a traditional gravity chute system used throughout San Francisco. The noise will be less because the air inlets typically will be located in garages and discrete areas, and are in use only when the particular type of waste is being emptied into the horizontal piping network. Each inlet typically will be emptied 2 or 3 times a day. The emptying into the system's pipe network process will likely generate noise in the 55-70 dB range level.

Noise levels within the central collection facility may reach levels between 60 and 80 dB. Sound isolation wrap on the pipes within each central collection facility will be installed to reduce the noise levels to approximately 60 dB. Inside the equipment room which houses the fans and some of the filtering equipment, noise levels can typically reach 110 dB. This room will not be occupied during operation. The fans will be acoustically wrapped, will be located in a sound insulated room, and will be mounted on an isolation base along with spring isolators that are attached to the floor. The mass of the base in conjunction with the spring isolators attenuates vibrations that may be transmitted to the floor. Vibration sensors are part of the fan and will shut down the fan if the fans become unbalanced.

[4] CalRecycle. Sample Odor Impact Minimization Plan. Available at: http://www.calrecycle.ca.gov/swfacilities/compostables/Odor/OIMP/Sample.doc.

[5] While this document was used as a guide for the attached odor management plan, many of its provisions are intended for a traditional waste collection or transfer facility and thus are not applicable to the AWCS.

Noise at the exhaust louvers during operation cycles will not exceed 65 dB measured at 15 feet. This is achieved by utilizing acoustic silencers in the pipe before the filter room and large acoustical louvers of 8 feet by 8 feet. The size of the exhaust louvers reduces air speed to around 5 mph, which significantly reduces any noticeable noise.

Construction

The 2010 EIR identified three construction related noise and vibration impacts:

- NO-1(a-c): Construction activities associated with the Project would generate increased noise levels for both off-site and on-site sensitive receptors; however, the Project's construction noise impacts would occur primarily in noise-sensitive areas adjacent or near to active construction sites (which would vary in location and duration over the entire period the proposed Project would be under construction); they would also not occur during recognized sleep hours, and would be consistent with the requirements for construction noise that exist in Sections 2907 and 2908 of the Municipal Code. (Less than Significant with Mitigation)
- Impact NO-2(a-c): Construction activities associated with the Project would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before Project construction activity on adjacent parcels is complete. Although the Project's construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 & 2908 of the Municipal Code, vibration levels would still be significant. (Significant and Unavoidable with Mitigation)
- Impact NO-3: Construction activities associated with the Project would result in a substantial temporary or periodic increase in ambient noise levels. (Significant and Unavoidable with Mitigation)

The construction noise and vibration impact assessment described in the 2010 EIR included construction activities in the areas where the AWCS are proposed to be located. Thus, the construction impacts of the AWCS were included in the 2010 EIR analysis. Consequently, the findings of the 2010 EIR for *Impact NO-1, Impact NO-2, and Impact NO-3* would not change based on the additional detail now available for the AWCS.

Operation

The 2010 EIR identified the following five noise and vibration impacts related to long-term operation of the Project:

- Impact NO-4: Implementation of the Project, including the use of mechanical equipment or the delivery of goods, would not expose noise-sensitive land uses on or off site to noise levels that exceed the standards established by the City. (Less than Significant)
- Impact NO-5: Implementation of the Project would not generate or expose persons on or off site to excessive groundborne vibration. (Less than Significant)
- Impact NO-6: Operation of the Project would generate increased local traffic volumes that could cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. (Significant and

Unavoidable)

- Impact NO-7: Noise during football games and concerts at the proposed stadium would result in temporary increases in ambient noise levels that could adversely affect surrounding residents for the duration of a game or concert. (Significant and Unavoidable with Mitigation)
- Impact NO-8: Implementation of the Project would not expose residents and visitors to excessive noise levels from flights from San Francisco International Airport such that the noise would be disruptive or cause annoyance. (Less than Significant)

Regarding *Impact NO-6,* the original Project analyses estimated over 500 trucks per day generated by the Project and is assumed to have included truck travel in a traditional waste collection system. The AWCS would not increase the truck travel on the main roads and would decrease travel on small residential roads. Thus, the impact of seven daily trucks (14 one-way trips) associated with each of the collection facilities were included in the EIR noise impact analysis, and the additional detail now available for the AWCS facilities would not change the conclusions of *Impact NO-6* regarding traffic noise levels.

Regarding *Impact NO-7,* the current Project does not include the stadium, and any noise impacts associated with the stadium are no longer relevant.

Regarding *Impact NO-8,* the original Project analysis assessed the potential for exposure of residents and visitors to excessive noise levels from flights to or from San Francisco International Airport. The inclusion of the AWCS facilities would replace the more traditional trash collection system for the developed area of the project site and would not change or influence the provision of residential or visitor uses in the project. Consequently, the AWSC facilities would not alter the conclusions identified in *Impact NO-8.*

Inclusion of the AWCS facilities could potentially alter the conclusions of *Impact NO-4* and *Impact NO-5.* Therefore, this supplemental assessment focuses on noise and vibration from operation of the AWCS potentially affecting nearby sensitive receptors. Below we describe the methods used in this supplemental noise and vibration impact assessment to determine whether the proposed AWCS facilities would result in any new significant noise or vibration impacts beyond those identified in the EIR or substantially increase the severity of a previously identified significant impact.

AWCS Noise Levels

To characterize the noise and vibration of the proposed AWCS equipment and processes, ENVIRON visited an AWCS collection facility at Swedish Medical Center in Issaquah, Washington. The Swedish Medical Center system is similar to, though smaller than, the AWCS facilities proposed for the Project.

Fan Room - The fan room of the Swedish Medical Center AWCS contains two 100 horsepower (hp) fans and a compressor. When the fans and compressor were operating at full power, the measured sound level inside the fan room was 88 dBA. Because the proposed AWCS facilities at the Project are expected to contain four 250 hp fans and two compressors, the sound level inside the proposed fan rooms could be as high as 7 dBA louder than measured at the Swedish Medical Center facility, resulting in an

estimated sound level of 95 dBA inside the fan rooms.

The following design features are expected to reduce the sound levels of the fans and compressors at locations outside of the AWCS central collection facilities:

- The fan rooms would be contained within the larger AWCS buildings.
- The walls of the fan rooms would be constructed of filled concrete block.
- The fans would be wrapped with acoustical blankets.
- The fans would be connected to the ducting with resilient collars.
- Fan exhaust would travel through a silencer, several filters, and an acoustic louver prior to exiting outside.

Exhaust Louver – Each AWCS facility would include an exhaust louver on the outside wall of the facility. The measured sound level of the exterior exhaust louver during full operation of the fans at the Swedish Medical Center was 51 dBA at 25 feet (adjusted from 60 dBA at a distance of 8.5 feet).

Waste Collection Area - The collection areas of the proposed AWCS central collection facilities would include four compactors/cyclones and ducting through which the collected material would travel. During the visit to Swedish Medical Center, ENVIRON measured a sound level of approximately 75 dBA at 25 feet due to trash flowing through ducting. However, this activity occurs only sporadically (assumed to be 5 minutes or less per hour), and the hourly Leq was estimated to be approximately 64 dBA at 25 feet. [6]

The sound level of the compactors was provided to ENVIRON by TransVac and is estimated to be approximately 57 dBA at 25 feet. For this assessment, the compactors were assumed to operate continuously, although they are not compacting trash the majority of the time.

The collection areas would be enclosed within the AWCS buildings but would include two sliding doors to allow truck access to the waste containers. The doors would remain closed until trucks arrive to remove full waste containers or to deliver empty containers.

Noise Model

ENVIRON conducted noise modeling of the AWCS facilities using Datakustik's CadnaA noise model, version 4.3.143, based on ISO 9613-2 calculation methods. CadnaA is similar to the model used in the EIR (SoundPLAN) and considers frequency-specific sound level data, topography, intervening buildings, barriers, atmospheric conditions, and other factors. The model allows the user to input frequency-specific sound level data based on measurements or manufacturer specifications. See **Appendix C.**

Using source data captured at the Swedish Medical Center AWCS and/or provided by TransVac, ENVIRON modeled the sound levels of the three proposed AWCS facilities Candlestick Point and Hunter's Point. Noise model receptors were selected based on proximity of sensitive uses to the proposed AWCS facilities. Modeled levels were predicted at the nearest existing off-site residential receivers,

[6] The Leq is the constant sound level that would contain the same acoustic energy as the varying sound level during the same time period (i.e., the average noise exposure level for the given time period).

nearest proposed on-site residential receivers, and if applicable, nearest non-residential noise-sensitive receivers.

Noise Standards

As for the noise assessment conducted for the EIR, ENVIRON compared the modeled sound levels to the noise standards established by the City of San Francisco (section 2909 of the San Francisco Noise Ordinance). For dwellings, the City applies a noise limit of 45 dBA between 10 PM and 7 AM (55 dBA between 7 AM and 10 PM) at locations inside a sleeping or living room. For this assessment, we assumed the windows would be open for ventilation and applied the noise limit at the exterior wall of the nearest dwellings. We also assumed the facilities could operate day or night, and applied the more restrictive nighttime noise limit of 45 dBA at the nearest dwellings. The City noise limits are applied to specific facility-related noise, not to the overall noise levels (i.e., not to the existing ambient levels plus the Project noise).

The City Noise Ordinance also restricts increases over ambient noise levels to 5 dBA when emanating from a residential use or 8 dBA when emanating from a commercial/industrial land use. Because this is a commercial use, the increase would be restricted to 8 dBA at neighboring properties. Existing ambient sound levels were based on the measured off-site ambient levels identified in the EIR. The ambient noise level can be established through measurement, but in no case shall be considered to be less than 45 dBA in exterior locations.

Model Results and Conclusions

Using the equipment sound level assumptions identified above, ENVIRON modeled the sound levels of the AWCS facilities at the Candlestick Point, Hunter's Point South, and Hunter's Point North facilities. Results of the AWCS noise modeling assessment are summarized in Table 3**.**

As shown in Table 3**,** the modeled sound levels of the AWCS facilities at the nearest existing or proposed residential dwellings to each proposed facility are 43 dBA or less. This would comply with the City's interior nighttime noise limit of 45 dBA applied to specific Project-related noise. Additionally, note that predicted sound levels are at the outside plane of a window, and not inside a living space. It is expected that, even with windows open, interior levels would be slightly lower than outside the building envelope.

In addition, the estimated increases over ambient levels at the nearest sensitive receivers to each site are 2 dBA or less, which would comply with the City's restriction on increases to 8 dBA or less due to commercial/industrial uses.

Based on the above, noise levels are expected to comply with the San Francisco Municipal Code, and thus the impact would be less than significant. These findings are consistent with the findings outlined in *Impact NO-4.*

Table 3
Noise Modeling Results, AWCS at Candlestick Point and Hunter's Point (dBA)

AWCS Location	Receiver Type	Ambient Levels (dBA, L90) a	Modeled Levels (Leq, dBA)b			Notes
			AWCS	Overall	Increase	
Candlestick Point	Nearest Proposed On-Site Residence	46	**38**	47	1	Approximately 110 feet north of the AWCS facility
	Nearest Existing Off-Site Residence	46	**21**	46	0	Approximately 500 feet northwest of the AWCS facility
	Nearest Proposed Commercial	46	**43**	48	2	Movie Theater, approximately 50 feet south of the AWCS facility
Hunter's Point South	Nearest Off-Site Residence (under	45	**29**	45	0	Approximately 200 feet northwest of the AWCS
Hunter's Point North	Nearest Proposed On-Site Residence	45	**32**	45	0	Approximately 110 feet northwest of the AWCS

Note: Apparent mathematical errors in the displayed increase are due to rounding to the whole number, not due to calculation errors.

[a]. The ambient level at the locations near the Candlestick Point development was considered to be the lowest of the measured ambient levels (identified as 46-50 dBA) at location N6 in EIR Table III.1-4. The ambient level near the Hunter's Point developments was considered to be 45 dBA, since most of the measured levels identified for location N3 in EIR Table III.I-4 were less than 45 dBA.

[b] Because the analysis assumed most of the equipment would operate continuously at full capacity, the modeled hourly Leq levels can be considered similar to the L90 levels (i.e., the level exceeded 90% of the time). The only exception is the sound from trash traveling through the ducts in the collection facility. The L90 level would not include this activity since it would occur less than 90% of an hour (i.e., less than 6 minutes per hour), but the modeled hourly Leqs include some of this sound energy. Therefore, the results can be considered conservative.

Waste Collection Noise Levels

As part of this review, ENVIRON also considered potential noises associated with the collection of the waste containers at the AWCS facilities. To characterize these sources, ENVIRON observed and measured a container pickup and drop-off at two different sites. Both the pickup and drop-off included brief, loud noises from the arrival and departure of a diesel truck, brake releases, the truck engine revving to lift the bed of the truck and pull up or lower the container, minor clanks and bangs, and the truck engine idling while the driver prepared the container for pickup or release.

[2] The L90 is the level exceeded 90% of the time, or 54 minutes of any hour. A container pickup/drop-off would occur for less than 15 minutes of any hour.

Because the waste collection truck is not a fixed source, it would not be subject to the interior noise limits for residences as identified in section 2909 of the San Francisco Noise Ordinance (i.e., 55 dBA during the day and 45 dBA at night inside sleeping or living rooms). However, it would be subject to section 2904, which regulates waste disposal services and requires the mechanical processing system on waste collection trucks to not exceed 75 dBA when measured at a distance of 50 feet from the equipment, and requires collectors to otherwise incorporate sound-deadening devices in their operations as are reasonably feasible in the judgment of the Director of Public Health. Furthermore, because the collection noise would occur only for short periods during the seven container pickups/drop-offs daily, it would not affect the ambient levels (as characterized by the L90 in the EIR).[7] Therefore, although the waste collection activities would produce brief, loud noises, these types and levels of noise would fall within the range of ordinary urban noise and would not result in significant noise impacts. These findings are consistent with the findings outlined in *Impact NO-4* as regard waste collection activities.

AWCS Vibration Levels

During ENVIRON's visit to the Swedish Medical Facility AWCS, there were no noticeable vibrations inside the fan room from the fans or any other equipment. The fans were mounted on an isolation base along with shock isolators that were attached to the floor. The mass of the base in conjunction with the shock isolators attenuated vibrations that may have been transmitted to the floor. These same design features will be used at the Candlestick Point and Hunter's Point AWCS facilities. Therefore, operation of the AWCS facilities would not generate or expose persons on or off site to excessive groundborne vibration and any impact would be less than significant. This finding is consistent with the finding outlined in *Impact NO-5.*

Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to noise and vibration impacts and would not require any new mitigation measures. Construction of the AWCS would be subject to MM NO-1a.1 requiring the use of noise reducing practices during construction. Additionally, there are no changed circumstances or new information that would change the FEIR's noise and vibration impact findings.

Cultural Resources and Paleontological Resources

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in both less than significant and significant unavoidable cultural and paleontological resource impacts and mitigation measures were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR findings because: (1) the new facilities would be constructed in areas where development was anticipated and analyzed in the FEIR; and (2) applicable Project mitigation measures would be required for the potential construction related impacts associated with the excavation required for the AWCS. Depending on the location and depth of excavation, potentially applicable mitigation measures include MM CP-2a for impacts to archeological resources and MM CP-3a for impacts to

[7] The L90 is the level exceeded 90% of the time, or 54 minutes of any hour. A container pickup/drop-off would occur for less than 15 minutes of any hour.

paleontological resources. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to cultural and paleontological resource impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's cultural and paleontological resources impact findings.

Hazards and Hazardous Materials

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant hazards and hazardous materials impacts and mitigation measures were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR findings because: (1) the central collection facilities and underground piping system would be constructed in areas where development was anticipated and analyzed in the FEIR; (2) the AWCS would not accept any hazardous waste or other sources of toxic contaminants; (3) implementation of applicable mitigation measures would be required for the potential impacts associated with the construction of the AWCS; and (4) construction of the AWCS would be required to comply with all applicable regulatory requirements for hazards and hazardous materials. Potentially applicable mitigation measures include MM HZ-1a for site mitigation plans, MM HZ-2a.1 for unknown contaminants, MM HZ-2a.2 for site specific health and safety plans, and MM HZ-15 for dust plans. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to hazards and hazardous material impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's hazards and hazardous material impact findings.

Geology and Soils

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant geology and soils impacts and mitigation measures were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR findings because: (1) the central collection facilities and underground piping system would be constructed in areas where development was anticipated and analyzed in the FEIR; (2) implementation of applicable mitigation measures would be required for the potential impacts associated with the construction of the AWCS; and (3) construction of the AWCS would be required to comply with all applicable regulatory requirements for geological and soils conditions. Potentially applicable mitigation measures include MM GE-2a for dewatering during construction, MM GE-4a.1, MM GE-4a.3, MM GE-6a, MM GE-10a, and MM GE-11a for site specific geotechnical investigations. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to geology and soils impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's geology and soils impact findings.

Hydrology and Water Quality

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant hydrology and water quality impacts and mitigation measures were required. The

additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR findings because: (1) the central collection facilities and underground piping system would be constructed in areas where development was anticipated and analyzed in the FEIR; (2) implementation of applicable mitigation measures would be required for the potential impacts associated with the construction and operation of the AWCS; and (3) construction and operation of the AWCS would be required to comply with all applicable regulatory requirements related to hydrology and water quality. Potentially applicable mitigation measures include MM HY-1a.1 and HY-1a.2 requiring stormwater pollution prevention plans, MM HY-1a.3 requiring a groundwater dewatering plan, MM HY6a.1 requiring compliance with the Municipal Stormwater General Permit and other regulatory requirements, MM HY-6b.1 limiting stormwater infiltration, and MM HY-12a.1 regarding finished grade elevations. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to hydrology and water quality impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's hydrology and water quality impact findings.

Biological Resources

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant biological resource impacts and mitigation measures were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR findings because: (1) the new facilities and underground piping system would be constructed in areas where development was anticipated and analyzed in the FEIR; (2) the collection facilities would be located on disturbed, urban sites with no sensitive biological resources; (3) the installation of the piping in the utility trenches would occur on disturbed, urban areas with no sensitive biological resources; and (4) implementation of applicable mitigation measures would be required for the potential impacts associated with the construction the AWCS. Potentially applicable mitigation measures include MM BI-6a.1 and MM BI-6a.2 calling for protection of bird nests during construction and MM BI-14a calling for the preservation and replacement of significant trees. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to biological resource impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's biological resource impact findings.

Public Services

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant public service impacts and mitigation measures were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR findings because: (1) the AWCS would be located in areas anticipated for development and AWCS was itself included in the analysis in the FEIR; (2) the AWCS would not increase population or employment projections or increase the density or intensity of development and thus would not increase any demand for public services; (3) the elimination of the many trash containers that otherwise would be located throughout the Project site

likely would reduce the opportunity for vandalism that may require police or fire services; and (4) implementation of applicable mitigation measures would be required for the potential impacts associated with the construction the AWCS. Potentially applicable mitigation measures include MM PS-1 requiring security measures during construction. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to public service impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's public service impact findings.

Recreation

The FEIR determined that the installation of infrastructure systems proposed in the Utilities Variant, including the installation of an AWCS, designed to better serve the proposed development would not generate additional residents or substantial additional employees in the area. Consequently, the Utilities Variant would not generate additional demand for recreational opportunities and the impact on recreation would be less than significant. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR finding. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to recreation impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's recreation impact findings.

Utilities

The FEIR determined that the installation of infrastructure systems proposed in the Utilities Variant, including the installation of an AWCS, would not generate additional residents or substantial additional employees in the area. Consequently, the Utilities Variant would not generate additional demand for utility services and the impacts would be less than significant. A potentially applicable mitigation measure is MM UT-5a for construction waste diversion. The additional design and operational detail provided in the application for the proposed AWCS would not change the FEIR finding. The additional central collection facility proposed for Hunters Point would be located on a site where development was assumed in the FEIR and would not change the FEIR utility service impact findings. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to utility service impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's utility service impact findings.

Energy

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant energy impacts and mitigation measures (identified in the Greenhouse Gas Emissions analysis) were required. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR finding because: (1) the AWCS would be located in areas anticipated for development and AWCS was itself included in the analysis in the FEIR; (2) the additional collection facility in HPS would be located on a site planned for development; (3) the system would not increase the population or

employment projections; and (4) the substantial reduction in the number of garbage trucks required to serve the Project would reduce energy demands. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to energy impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's energy impact findings.

Greenhouse Gas Emissions

The FEIR determined that the Utilities Variant, including the installation of an AWCS, would result in less than significant greenhouse gas emissions impacts. The additional design and operational detail provided in the application for the proposed AWCS, including the additional central collection facility in Hunters Point, would not change the FEIR finding because: (1) the AWCS would be located in areas anticipated for development and AWCS was itself included in the analysis in the FEIR; (2) the additional collection facility in HPS would be located on a site planned for development; (3) the substantial reduction in the number of garbage trucks required to serve the Project would reduce greenhouse gas emissions. MM GC-2 requiring businesses to exceed the 2008 Title 24 energy efficiency requirements would apply to the AWCS. Thus, the proposed AWCS would not change or alter any of the FEIR's findings with respect to greenhouse gas emission impacts and would not require any new mitigation measures. Additionally, there are no changed circumstances or new information that would change the FEIR's energy impact findings.

Conclusion

Based on the foregoing, it is concluded that the analyses conducted and the conclusions reached in the FEIR certified on June 3, 2010 remain valid. The implementation of the AWCS will not cause any new significant impacts not identified in the EIR, and no new mitigation measures will be necessary to reduce significant impacts. Other than as described in this Addendum, no Project changes have occurred, and no changes have occurred with respect to circumstances surrounding the project that will cause significant environmental impacts to which the project will contribute considerably , and no new information has become available that shows the project will cease significant environmental impacts. Therefore no supplemental environmental review is required beyond this addendum.

Date of Determination:

May 2, 2014

I do hereby certify that the above determination has been made pursuant to State and Local requirements.

SARAH B. JONES
Environmental Review Officer

cc: Therese Brekke, Lennar Urban
Immanuel Bereket, OCII
Bulletin Board / Master Decision File
Distribution List

FEHR PEERS

April 16, 2014

Ms. Joy Navarette
San Francisco Planning Department
1650 Mission Street, 4th Floor
San Francisco, CA 94103

Subject: Transportation Analysis of the Automated Waste Collection System Proposed for the Candlestick Point – Hunters Point Shipyard Phase II Project

Dear Joy:

This letter summarizes the potential changes to transportation impacts of the Candlestick Point / Hunters Point Shipyard Phase II development plan associated with locating three centralized trash collection locations within the development areas. In Candlestick Point, the collection facility will be located in the retail center, with access either from Arelious Walker Drive, between Harney Way and Ingerson Avenue. Within the Hunters Point Shipyard area, two facilities will be constructed. One will be constructed in Parcel 1 in the HPS South area with access from the diagonal street connecting Crisp Avenue and Fischer Street. The second will be constructed in Parcel 4 of the R&D area in the Shipyard development with access from Spear Avenue. Trucks will travel between each of these three sites to the San Francisco solid waste facility at Tunnel and Beatty Roads or to the recycling facility at Pier 96, at Cargo Way and Jennings Street.

OPERATIONAL CHARACTERISTICS

Trash will be collected from buildings throughout the project site to three centralized locations via a series of underground tubes.[1] The result will be that trash collection trucks will not need to circulate throughout the project site, but will instead travel to and from the centralized collection locations. The collection locations will be sited on the northwest corner of the Candlestick Point retail center, Parcel 1 in the HPS South area, and Parcel 4 of the R&D area in the Shipyard development.

According to the operator, approximately seven trucks per day will enter each of the three centralized sites, pick up trash, and leave the site, for a total of 14 trips per day (7 inbound and 7 outbound trips) per site. Trucks will typically be 40-foot trucks. The precise location of any of the driveways is unknown, but they would all be required to conform to driveway standards described in the respective Design for Development (D4D) documents. Truck trips will typically occur

[1] Public areas of the Project site, such as sidewalks and parks, will be served by traditional trash collection methods and will not be included in the automated waste collection system.

between 6 AM and 11 PM, consistent with the hours of operation allowed by the San Francisco Department of Public Health.

Candlestick Point Retail Site

For the facility to be located in Candlestick Point, trucks destined for the San Francisco solid waste transfer station at Tunnel and Beatty Roads would use Arelious Walker Drive, Harney Way and Beatty Road to access the facility. Exiting trucks will leave the site by turning left onto Arelious Walker Drive from the site's driveway, on to Harney Way and then toward US 101. To facilitate this, a median break would be provided on Arelious Walker Drive. Trucks destined for the recycling facility at Pier 96 would enter US 101 northbound from Harney Way, and immediately exit at the Paul Avenue/Third Street off-ramp. Trucks would travel northbound on Third Street to Cargo Way, and then east on Cargo Way to Pier 96.

Hunters Point South Parcel 1

For trucks traveling between the San Francisco solid waste transfer facility and the site located in Hunters Point South Parcel 1, trucks would travel along Third Street, Palou Avenue, and Crisp Road, entering the site from the diagonal road connecting Crisp Road and Fisher Street.

For trucks traveling between the recycling facility at Pier 96 and the site located in Hunters Point South Parcel 1, trucks would travel along Jennings Street, Evans Street, Hunters Point Boulevard, Innes Avenue, Donahue Street, Lockwood Avenue, Fischer Street and then to the diagonal street connecting Fischer Street and Crisp Avenue.

R&D Parcel 4

Trucks traveling between the San Francisco solid waste transfer facility and the site located in Hunters Point R&D Parcel 4 would use the same route as for the Hunters Point South Parcel 1 facility, but would continue on to Fischer Street and Spear Street to the entrance located on Spear Street near "B" Street.

For trucks traveling between the recycling facility at Pier 96 and the site located in Hunters Point R&D Parcel 4, trucks would travel along Jennings Street, Evans Street, Hunters Point Boulevard, Innes Avenue, Donahue Street, Lockwood Avenue, and Spear Street to the entrance located on Spear Street near "B" Street.

IMPACTS

The traffic generation forecasts prepared in the project's EIR included trips generated by various services associated with new development, including trash and mail delivery, based on typical conditions when trash is collected throughout the site at individual buildings. Therefore, the fact that all trash would now be consolidated at three centralized locations may slightly increase the number of truck trips to those locations, but would also slightly reduce the traffic levels

throughout the rest of the project because trucks would no longer have to circulate throughout the site to individual buildings. However, the change in traffic volumes at any given location would likely be no more than one or two truck trips per hour, which would be negligible.

Finally, the roadways within the project site, specifically Harney Way and Arelious Walker Drive, within Candlestick Point, and Cargo Way, Jennings Street, Evans Avenue, Innes Avenue, Donahue Street, Lockwood Avenue, Fischer Street, and Spear Avenue in the Hunters Point Shipyard area have been designed to accommodate 40-foot trucks, similar to those operated as part of the proposed trash collection facility. Therefore, trucks should be able to safely maneuver within the project.

The location of the facility driveways would conform to the criteria described in the D4D documents, and would therefore conform to reasonable design standards. Therefore, the design of the roadway network and the location of the driveways will be consistent and compatible with the proposed circulation of trucks to and from the collection sites.

Therefore, the effects of locating the facilities at their proposed locations would not change the conclusions summarized in the project's EIR.

We hope you have found this helpful. Please do not hesitate to call if you have any questions.

Sincerely,
FEHR & PEERS

Chris Mitchell, PE
Principal

SF08-0407

ENVIRON

May 2, 2014

MEMORANDUM

To: Joy Navarrete, Planning Department, City and County of San Francisco

From: Michael Keinath
Sarah Klug

Cc: Therese Brekke, Lennar Urban

Subject: Air Quality Analysis for the Automated Waste Collection Systems in the Candlestick Point-Hunters Point Shipyard Phase II Development Plan
Planning Department Case File No: 2007.0946E

Introduction

The Environmental Impact Report (EIR) for the Candlestick Point – Hunters Point Shipyard Phase II Development Plan (San Francisco Planning Department Case Number 2007.0946E) was certified by the City in June 2010. The FEIR analysis included discussion of an Automated Waste Collection Systems (referred to herein AWCS) in the Utilities Variant. The project sponsor, Lennar Urban, is seeking approval of the AWCS and additional details about the design are now available. This memorandum evaluates the proposed AWCS in light of the analysis and conclusions reached in the FEIR.

Project Description

The AWCS is a type of waste collection system. Instead of implementing the traditional method where waste trucks pick up trash on the side of the road, users will deposit their waste into inlets to an underground network of waste collection pipes that lead to one of three AWCS Facilities.

Separate inlets for regular trash, recycling items, and compostables will be located in every building and at appropriate public locations. Waste would enter the underground distribution network of piping periodically throughout the day. The pipes transport waste using vacuum pressure and air velocity created by electrically powered large suction fans. Once the waste reaches the AWCS Facility, the waste is separated from the transport air with a cyclone separator. The waste is then compacted with a compactor feed hopper and stored in separate 40 cubic yard containers, one for each waste stream – trash, recycling and compostables. When the containers of waste are full, trucks will transport the full container to either Recology's Tunnel Beatty Site (for trash and compostables) or their recycling facility at Pier 96 (recycling). An estimate of seven trucks per day would be needed to transport the full containers. The containers will be completely enclosed while onsite and in transport. Meanwhile, the exhaust air would pass through a multi-stage dry filtering system to remove particulates. One collection facility will be located on top of the parking garage for the retail center in Candlestick Point at the southwest corner of the intersection of Arelious Walker Way and Ingerson Avenue. The other two collection facilities will be located in Hunters Point Shipyard – one near Crisp and Ring Roads in a Research and Development area and one at Spear Avenue near C Street in a Research and Development area. Before the construction of the AWCS facilities is complete, Recology will handle waste collection using its current waste cart and collection truck methods.

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Construction

The FEIR evaluated three construction related air quality impacts: *Impact AQ-1: Criteria Pollutants (Construction)*, *Impact AQ-2: DPM from Construction Activities*, and *Impact AQ-3: TACs from Construction Activities*. The construction activity data that was used to estimate emissions included construction in the areas where the facilities will be located. The construction HRA in the FEIR also included construction activities and construction emission sources in these locations. Thus, the construction impacts of the ACWS were included in the FEIR analysis. Consequently, the findings of the FEIR for *Impact AQ-1: Criteria Pollutants (Construction), AQ-2: DPM from Construction Activities*, and *Impact AQ-3: TACs from Construction Activities* would not change based on the additional detail now available for the AWCS. Construction of the AWCS would comply with MM AQ 2.1 for construction emissions.

Operational Emissions

The FEIR evaluated operational emissions in *Impact AQ-4: Criteria Pollutants (Operational)* and *Impact AQ-5: Carbon Monoxide*. The FEIR included an analysis of CAP emissions from 78,109 daily external motor vehicle trips and area sources such as natural gas combustion, maintenance equipment, and consumer product use. Implementation of the AWCS would result in CAP emissions from truck travel and PM emissions from the exhaust of the AWCS Facilities.

In the FEIR, the emissions from the 78,109 trips were estimated using URBEMIS, which assumes a standard mix of vehicle types for the city/county. This mix would include both heavy trucks and passenger cars. The mix of vehicles for the city/county includes vehicles used for all types of trips, including waste pick up.

With implementation of the AWCS, the total quantity of vehicle miles traveled by garbage trucks throughout the Project would be significantly reduced. Each facility would have approximately 14 one way daily truck trips (7 trucks to and from each central collection facility), resulting in 21 daily round truck trips which go directly to and from each central collection facility rather than from building to building throughout the Project. Thus, emissions from the truck trips associated with the AWCS were fully accounted for in the FEIR and actual truck emissions with implementation of the AWCS would be lower than estimated in the FEIR due to the AWCS reduced truck miles traveled.

Emissions from the exhaust of the AWCS central collection facilities are expected to be minimal due to the design of the multi-stage dry filtering system. In an effort to further minimize emissions from the facilities, the filtration system will be designed to meet the Bay Area Air Quality Management District's (BAAQMD) Best Available Control Technology (BACT) for "Solid material storage - Enclosed".[1] The BACT limit is 0.01 grains per dry standard cubic foot (gr/dscf). Given this emission rate and the exhaust rate of the system, emissions for solid material storage would be 27.2 pounds per day (lb/day) or 4.96 tons PM_{10} per year for one facility, as shown in Table 1. A source test may show that actual emissions from the AWCS may be much lower. Once the AWCS is operational, Recology will conduct initial testing of exhaust air for PM_{10} emissions to ensure the emissions do not exceed this estimated rate. Recology will also develop an Operation Plan for the AWCS which will include a periodic monitoring schedule for testing air emissions from the AWCS. Recology will notify the San Francisco Department of Public Health (SFDPH) in its oversight role as Local Enforcement Agency (LEA) under CalRecycle prior to commencing AWCS operations. Testing results will be submitted to the LEA within 30 days of receipt of final testing results.

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[1] BAAQMD. BACT Guideline. Section 11, Miscellaneous Sources, Solid Material Storage – Enclosed. Doc. # 1571.1 (10/18/91). Available at: http://hank.baaqmd.gov/pmt/bactworkbook/default.htm.

Table 1: Estimated PM_{10} Emissions from Discharge of one Facility based on assumed BACT Emission Rate

Emissions	Flow Rate	Emissions	
gr/dscf	scf/min	lb/day	tons/year
0.01	13,200	27.2	4.96

The FEIR determined that *Impact AQ-4* was significant and unavoidable. The FEIR estimated PM_{10} emissions from the 2010 Project to be 1,490 lb/day. Assuming the emissions in Table 1 from the discharge at each of the three collection facilities, calculated PM_{10} emissions for the Project would increase by approximately 6% overall. However, the reduced truck travel distances associated with the AWCS would also decrease PM_{10} emissions, such that a net increase of PM_{10} emissions, assuming the Table 1 levels, would be less than 6% of that total. Such a change in Project emissions would not change the conclusions of *Impact AQ-4: Criteria Pollutants (Operational)*. Further, the conclusions related to *Impact AQ-5: Carbon Monoxide* (less than significant) would not change based on the additional detail now available for the AWCS. The AWCS is an all-electric system and thus no emit carbon monoxide emissions are generated and the AWCS reduces truck travel.

Health Impact of Operation of the Facilities

The FEIR evaluated the concentrations of TACs from operation of Research and Development uses in *Impact AQ-6: Toxic Air Contaminants*. The AWCS will not accept any hazardous waste or other sources of TACs. While TACs may be associated with waste, the waste will be stored at the collection facilities for a less than a day and hence would not be expected to break down and emit TACs. Furthermore, any decay of materials will occur within the enclosed containers ensuring that TACs will not be emitted into the environment at any appreciable quantities. Thus, the AWCS would not change the findings of *Impact AQ-6: Toxic Air Contaminants* (less than significant with mitigation).

Impact AQ-7: Traffic $PM_{2.5}$ evaluated the impact of vehicular traffic on $PM_{2.5}$ concentrations. The operation of the AWCS would result in $PM_{2.5}$ emissions from trucks transporting the waste offsite. Seven trucks per day are expected to come to each of the three collection centers to collect the waste and transport it to the Recology Transfer Station at Tunnel Road or the recycling facility at Pier 96. The FEIR evaluated the $PM_{2.5}$ concentration attributable to emissions from vehicles on surface streets in the Candlestick Point and Hunters Point Shipyard area as a result of the Candlestick Point-Hunters Point Shipyard Phase II Development in accordance with San Francisco's Article 38. Several roads were analyzed, including Third Street, Harney Way, and Evans Avenue. Article 38 focuses on $PM_{2.5}$ concentration as opposed to other chemicals of concern. While $PM_{2.5}$ is not the only pollutant of concern, the FEIR states that "the threshold concentration of $PM_{2.5}$ is meant to serve as a health-protective 'proxy' or surrogate for pollutant exposure from vehicles."

Different types and sizes of vehicles emit air pollutants in different amounts. When determining the emissions from this traffic, a mix of vehicles was assumed. This "fleet mix" was determined using ratios of vehicle miles travelled by vehicle class reported in California Air Resources Board's Emission Factor Model (EMFAC), and thus it includes a certain percentage of trucks. Based on the traffic volume from the transportation analysis and percent of trucks from EMFAC, the Article 38 analysis assumed over 500 trucks per day on the roads analyzed, depending on the road. The estimate of truck traffic in EMFAC is based on projections of all types of truck traffic, which includes truck travel associated with a traditional waste collection system. Thus, by using EMFAC's fleet mix, the previous analysis would have included truck travel associated with a traditional waste collection system. The AWCS would decrease the truck travel on the main roads due to the larger capacity of the trucks associated with the AWCS and would virtually eliminate travel of waste collection trucks on

small residential roads. Thus, the impacts of the seven trucks (14 one-way trips) associated with each of the central collection facilities were included in the Article 38 analysis and the additional detail now available for the AWCS would not change the conclusions of *Impact AQ-7: Traffic $PM_{2.5}$* (less than significant).

Odors

Impact AQ-8: Odors states that "there may be some potential for small-scale, localized odor issues to emerge around project sources such as solid waste collection, food preparation, etc." The FEIR found the effects "would be resolved by interventions after receipt of any complaints" and would be less-than-significant.

Recent BAAQMD guidance recommends reviewing odor complaints for similar facilities in the area to determine odor impacts of the proposed facility.[2] While there are no similar AWCS facilities nearby, TransVac has built and operated other similar facilities, most near hospitals. TransVac representatives report that TransVac has received no odor complaints from these facilities. Furthermore, to observe the odor conditions at a similar TransVac facility, ENVIRON visited the facility at the Swedish Hospital near Seattle, Washington. The site visit occurred during normal operating hours and conditions and when waste was emptying into the compactor. ENVIRON staff did not experience any odors at the site.

Furthermore, the features of the AWCS substantially minimize odor compared with a conventional waste collection system. With the AWCS, waste is deposited through inlets, drops into a hold chamber, and is held in place until a valve opens and allows the material to drop into the horizontal underground transport pipe network. The valve closes immediately after waste drops into the pipe network. This network is sealed throughout the system, and any potential odor is contained within the piping network. Waste held in the chamber will be emptied at least every 8 hours. Should the holding chambers fill up prior to the next scheduled time, a photo detector will automatically trigger the emptying of the chamber. In conventional waste collection systems, waste may be stored in trash containers inside buildings, outside residential units, or at curbside for up to 7 days prior to collection, resulting in odor where people live and work. The longer waste is allowed to molder, the greater the potential for odors. The AWCS would reduce the time waste is stored in building holding chambers to 8 hours or less. Furthermore, the AWCS is always under negative pressure so there is no buildup of odors.

The AWCS concentrates waste collection and the potential for odors to the three AWCS central collection facilities, but the potential for odors at the facilities might be less than the odors collected at any individual site in a conventional waste collection system. The lids to containers in a conventional waste collection system may be left open or ajar, allowing odors to be released, which is especially problematic during warm weather. The AWCS eliminates these sources of odors by eliminating individual cans and keeping waste enclosed. Even at the central collection facilities, the waste would be enclosed. Waste transported through the sealed pipe network travels to a cyclone separator and a waste compactor, which compresses the waste into sealed metal transport containers. When an AWCS waste container is full it is disconnected from the compactor and transported by truck to a waste disposal or recycling facility. The waste would be stored at the site for less than a day, compared with waste left for up to 7 days at residences and commercial properties in a conventional system.

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[2] BAAQMD. 2012 CEQA Air Quality Guidelines. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en

According to TransVac, odor has not been an issue at the existing known AWCS facilities, presumably due to features incorporated into the design. The only odiferous air that vents to the atmosphere is the discharge of the network of pipes. Before this air is discharged to the environment, the air is separated from waste with the cyclonic separator, and flows through a filter room. Due to the sheer volume of air needed to pull the waste through the system to the central collection facilities, odors are expected to be diluted before even receiving treatment. Air inlets will be located in the piping system in the streets and will occur throughout the community. These tend to be located upstream of waste inlets. Odors are not expected to be released from these inlets because the system is kept at negative pressure. In the event of a power outage, air could exist the vents, but such a situation would be temporary and rare. Further, the system could be evacuated to remove waste if necessary and eliminate any collection of odors.

Nonetheless, to reduce the potential for complaints and small-scale, localized odor issues, Recology and TransVac have prepared and would comply with an *Odor Management Plan*. This plan uses CalRecycle's Sample Odor Impact Minimization Plan[3,4] as a guide for addressing odors. The Odor Plan, which is included as Attachment A of this document, outlines an odor monitor protocol, odor complaint response protocol, and describes the odor management measures.

Due to the design of the facilities, AWCS would not change the conclusion of *Impact 8: Odors* (less than significant). Further, Recology would manage the AWCS to minimize odors and address odor complaints if any, in compliance with the Odor Management Plan. Finally, the LEA has the authority to ensure that odor complaints, if any, are adequately addressed by Recology.

Regional Air Plans

Impact AQ-9: Consistency with Regional Air Plans compares the Candlestick Point – Hunters Point Shipyard Phase II Development Plan with the *Bay Area 2005 Ozone Strategy* and the *2009 Clean Air Plan*. The review of both plans focused on transportation and the need for smart growth. The AWCS is consistent with reduced transportation and smart growth strategies because the system takes heavy duty waste collection trucks off of neighborhood roads and reduces the total amount of truck miles driven. Thus, the AWCS would not conflict with the findings of *Impact AQ-9: Consistency with Regional Air Plans* (less than significant).

Attachments:

Attachment A: *Odor Management Plan for the Candlestick Point/Hunters Point Phase II Project AWCS*

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[3] CalRecycle. Sample Odor Impact Minimization Plan. Available at: http://www.calrecycle.ca.gov/swfacilities/compostables/Odor/OIMP/Sample.doc.

[4] While this document was used as a guide for the attached odor management plan, many of its provisions are intended for a traditional waste collection or transfer facility and thus are not applicable to the AWCS.

Attachment A

Odor Management Plan for the Candlestick Point/Hunters Point Phase II Project AWCS

Attachment A

Odor Management Plan for the Candlestick Point/Hunters Point Phase II Project AWCS

Odor Management Plan

Automated Waste Collection System

Candlestick Point/Hunters Point

Phase II Project AWCS

Prepared April 2014

Contents

1 Introduction

This Odor Management Plan (OMP) documents odor management practices that will be implemented at the central collection facility for the Automated Waste Collection System ("AWCS") Facility located at Candlestick Point in San Francisco, California. This OMP will be available at the Facility to operations and inspection personnel, and revised as necessary to reflect any changes in the design or operation of AWCS Facility. This OMP and supporting documents will be made available to the San Francisco Department of Public Health, the Bay Area Air Quality Management District, or other local enforcement agency when requested.

The AWCS is a type of waste collection system that accommodates the collection of trash, recyclables, and compostables. Instead of implementing the traditional method of waste collection where waste trucks pick up waste in small containers located on the curb, users will deposit their waste into inlets to an underground network of waste collection pipes that leads to the AWCS Facility.

Separate inlets for the disposal of regular trash, recycling items, and compostables will be located in every building and at appropriate public locations. Waste will enter the underground distribution network of piping periodically throughout the day as users deposit waste into the inlets. The pipe transports waste using vacuum pressure and air velocity created by electrically powered large suction fans. Once the waste reaches the AWCS Facility, the waste is separated from the transport air with a cyclone separator. The waste falls into an in-feed hopper and is compacted and stored in containers ("containers"), one for each waste stream – trash, recyclables and compostables. The compactors and containers are stationary, and are located in an enclosed building. When the containers of waste are full, roll-off trucks will transport the containers to either Recology's Tunnel Beatty Site (for trash and compostables) or the recycling facility at Pier 96 (recyclables). An estimate of seven trucks per day will be needed to transport the full containers. The containers will be completely enclosed while onsite and during transport. Meanwhile, the exhaust air would pass through a multi-stage dry filtering system to remove particulates. The AWCS Facility layout is shown in Attachment A.

The Facility will accept both residential and commercial waste continuously 24 hours per day, 7 days per week. The disposal of hazardous wastes or other toxic wastes is not permitted.

Odors have not been an issue at any other AWCS site due to the odor reducing strategies built into the system design, which will also be implemented at the Candlestick Point Site. Nonetheless, this Odor Management Plan was prepared to minimize the risk of producing odors, and to establish best practices with respect to odor management during operations.

1.1 Key Waste Reduction Design Features

By design, the AWCS minimizes odors. When the waste is transported through the enclosed AWCS system, it does not come into contact with the ambient environment, which reduces the potential for odors to escape. After the waste enters an AWCS inlet, the waste travels through a completely enclosed piping system, until it reaches an enclosed cyclone, in-feed hopper, compactor, and waste storage container. The only time any waste may be exposed to ambient

air is when the storage container inside the facility is disconnected from the compactor prior to being sealed for transport which should only amount to a matter of minutes.

The air that is used to transport the waste to the AWCS is separated from the waste in the cyclone and released to the atmosphere through an exhaust stack. Due to the sheer volume of air needed to force the waste through the system to the Facility, any odors are greatly diluted before release. The limited capacity of the containers ensures the waste will be kept onsite for a short time, usually a matter of hours, which reduces the amount of time the waste has to decay and potentially produce more odors.

2 Odor Monitoring Protocol

2.1 Proximity to Odor Receptors

The nearest receptors may include residents and medical staff in the Life Care building, residences, retail customers, workers and vendors, hotel residents and staff, people visiting the movie theatre, restaurants and fitness club, schools, places of worship, people playing at the playground and workers located around the project site. Table 1 shows the distance from the AWCS Facility to the closest receptor by type and direction.

Table 1: Distance and direction to the off-site receptors

Receptor	Closest Distance from AWCS (feet)	Direction
Residents and Medical Staff of Life Care Building	53	North of the facility
Other Residences	420	North-West of the facility
Retail	45	East of the facility
Hotel	625	South of the facility
Movie Theatre	10	South of the facility
Restaurant	45	East and South of the facility
Fitness Club	469	South of the facility
Playground	866	North of the facility
School	866	North of the facility
Place of Worship	1,203	North of the facility

2.2 Method for Assessing Odor Impacts

Each operating day, the operator will evaluate on-site odors and operations for potential release of objectionable odors. Potential releases include, but are not limited to:

- Receipt of exceptionally odorous material.
- Unanticipated delays in transporting material offsite.

If questionable or objectionable on-site odors are detected by site personnel, operations personnel will implement the following protocol, as appropriate:

1. Investigate and determine the likely source of the odor.

2. Assess the effectiveness of available on-site management practices to resolve the odor event and immediately take steps to reduce the odor-generating capacity of on-site material as follows:

    - If material is exceptionally odorous on receipt, add carbon source and/or detergent based deodorants at the compaction phase to adsorb the odorous compounds.
    - In case of leaks through the pipes during suction, cyclone separation or compaction phases, clean aisles of spilled materials and treat with carbon source and/or other detergents or products to mitigate odor.

3. Determine if the odor traveled off-site by surveying the site perimeter and noting existing wind patterns.

4. If it is determined that possible odors impacts occurred, contact the appropriate local enforcement agency and/or neighbors.

5. Record the event for further operational review.

3 Meteorological Conditions

To determine meteorological conditions and patterns at the AWCS Facility, meteorological data collected from a station installed by the Bay Area Air Quality Management District at the Hunter's Point Shipyard for a period from October 1, 2002 through September 30, 2003 was analyzed. This location is just over one mile away from the AWCS Facility and has similar surrounding terrain and land use, so was considered representative of the site. Attachment B shows wind rose plots of this data for the entire year as well as by seasons.

The annual wind rose shows that the prevailing dominant winds are the westerly winds. The prevailing dominant winds from April through October are also westerly winds. During the colder months, i.e. November through March, winds are not as strong and do not have a particular dominant wind direction.

4 Odor Management Measures

4.1 Enclosed Waste Processing and Storage

The AWCS Facility is a fully-enclosed system that uses underground pipes and pressurized air to transport municipal solid waste, including recycling and compostable materials, from waste inlets to enclosed centralized waste collection facilities. As a result, the AWCS system significantly minimizes the potential for odors in waste inlets, waste storage areas and areas where waste is compacted and operators will ensure the system remains enclosed. The system operates 24 hours/day, which reduces the amount of time waste has to accumulate and decay. Following compaction, the waste moves into a closed waste storage Container for removal. These components are housed within an enclosed building. In an effort to ensure waste is not exposed to the ambient environment, any leaks or openings in the pipes, hopper, or container will be repaired as soon as is practicable.

4.2 Covered Containers

The system is designed so that the metal containers will always be covered and closed, helping ensure that the waste will not be released from the containers. The operators of the AWCS and the material delivery drivers will ensure the containers are always securely closed during transport. As mentioned previously, when the containers are disconnected from the compactors, a modest amount of waste will be exposed to the ambient environment for a brief time. The operators and material delivery drivers will ensure the containers are closed as soon as they are disconnected from the compactors.

4.3 Door closures

The aboveground portion of the AWCS Facility is enclosed within a building. The trucks access the covered containers through roll-up doors. These doors will remain closed unless a truck is accessing a container for transport to minimize the release of facility air to the environment.

4.4 Contact Information

Facility personnel will install a sign indicating a contact person to call for questions or complaints about the Facility. The sign will show both a Facility and Bay Area Air Quality Management District (BAAQMD) phone number that is accessible 24 hours a day, 7 days a week. The sign that will be posted is shown in Attachment C.

The sign will meet the following requirements:

- installed within 50 feet of the main entrance to the facility
- at least 48 inches wide by 48 inches tall
- lettering at least 4 inches tall
- text contrasting with the sign background
- lower edge of the sign located between 6 and 8 feet above grade.

4.5 Housekeeping

Facility personnel will sweep or clear the facility floor and other areas of the facility in the case of a system upset which causes trash to accumulate outside of the closed containers. The facility floor will be swept, followed by the use of detergents or other products to mitigate odors, if necessary.

The facility floor will be completely swept or cleared as needed but not less than once a week. The sweeping/cleaning activity will be logged in a sweeping log as shown in Attachment D.

The facility personnel will ensure that the cyclone separator and hopper remain unobstructed and clean.

The waste storage containers will be washed after the contents are unloaded to reduce odors from residual waste. This washing will occur at Recology's Tunnel Beatty Site and not at the AWCS facility.

4.6 Breakdown Procedures

In the event of a power outage or scenario that prevents operation, the facility will not be able to receive waste. Waste may have been in transport when the power outage occurred and hence would be stalled somewhere in the system of piping. To reduce odors from waste under these circumstances, the facility personnel will ensure that the system piping at the facility remains intact and will keep the waste completely enclosed.

In the event that waste cannot be transported offsite due to breakdown, the facility personnel will employ all feasible measures to reduce odors from the onsite waste.

4.7 Control Strategies

Odor control strategies are built into the AWCS design; accordingly other control strategies are not anticipated at this time.

5 Complaint Response Protocol

5.1 Protocol for Handling Complaints

On the days when odor complaints are received by the AWCS Facility, or on days when notified by the District or the appropriate local enforcement agency that an odor complaint has been received for the Facility, a Facility representative will conduct an odor survey of the surrounding community as soon as practical, but not to exceed 2 hours after receiving the complaint, or notification from the District or the appropriate local enforcement agency.

The survey will be conducted in a complete radius at no less than 4 locations around the Facility, which would extend as far outward as odors are detected. The odor survey results will be documented in a complaint response odor survey form, as shown in Attachment E.

If contact information from the complainant is available, the operator at the Facility will contact that person to inform him/her of how the odor is being addressed within one week of receiving the complaint.

If the odor survey shows that the design of the system or this odor management plan could be updated to reduce the odors that caused the complaint, the Facility will make these updates if cost effective.

The odor surveys and logs will be reviewed once every 12 months. For repeat complaint situations, the Facility will review the survey logs and identify if design or structural changes are needed to be made to the Facility to reduce odors. This Odor Management Plan will also be reviewed and updated with methods to reduce odor sources related to the AWCS Facility. A plan to address a repeat complaint will be developed within two weeks of a third similar complaint.

5.2 Written Log of Odor Complaints

Whenever an odor complaint is received, operators shall fill out information on the complaint as shown in Attachment F. The operators at the facility will maintain a written log of all odor complaints received, for a minimum of 2 years from the date of receipt of the complaint and make the log available upon request.

Appendix A

Facility Layout

DIAL TOLL FREE
1-800-227-2600
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF NORTHERN CALIFORNIA

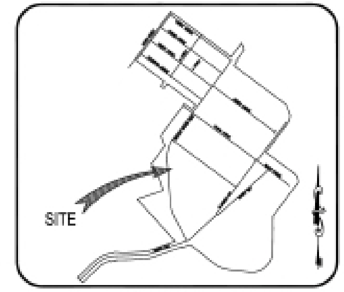
SITE LEGEND

SITE INFORMATION
SITE AREA = 31,500 SQ. FT. (0.69 ACRES)
BUILDING FOOTPRINT = 6,350 SQ. FT.

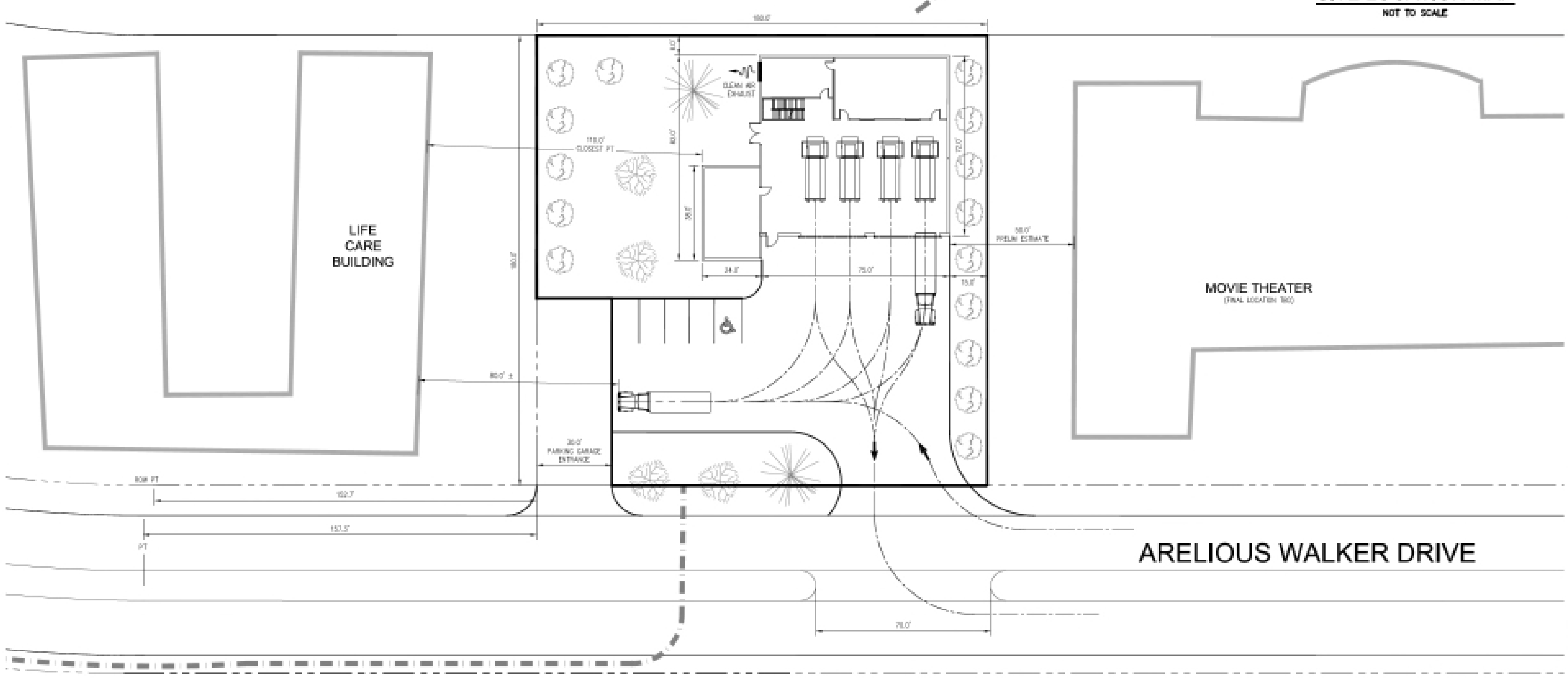
PARKING
4 SPACES + 1 HANDICAP (11'x18') = 5 SPACES

LANDSCAPING
EXTERNAL/STREET LANDSCAPING
STREET FRONTAGE = 3 TREES
INTERNAL LANDSCAPING
TOTAL TREES/SHRUBS = 18 TREES

DRAINAGE AND LIGHTING TBD



SITE LOCATION MAP
NOT TO SCALE



SITE PLAN - AWCS COLLECTION CENTER

Recology WASTE ZERO

TransVac SOLUTIONS

DATE	DRAWN BY:	PROJ. ENGR	PROJ. MGR
11/26/2013	—	—	—

CANDLESTICK POINT
SUB-PHASE CP-02
AUTOMATED WASTE COLLECTION SYSTEM
CANDLESTICK POINT REDEVELOPMENT
CITY AND COUNTY OF SAN FRANCISCO
CALIFORNIA

SHEET NUMBER
WC-1.7

JOB NUMBER
529-01

Appendix B

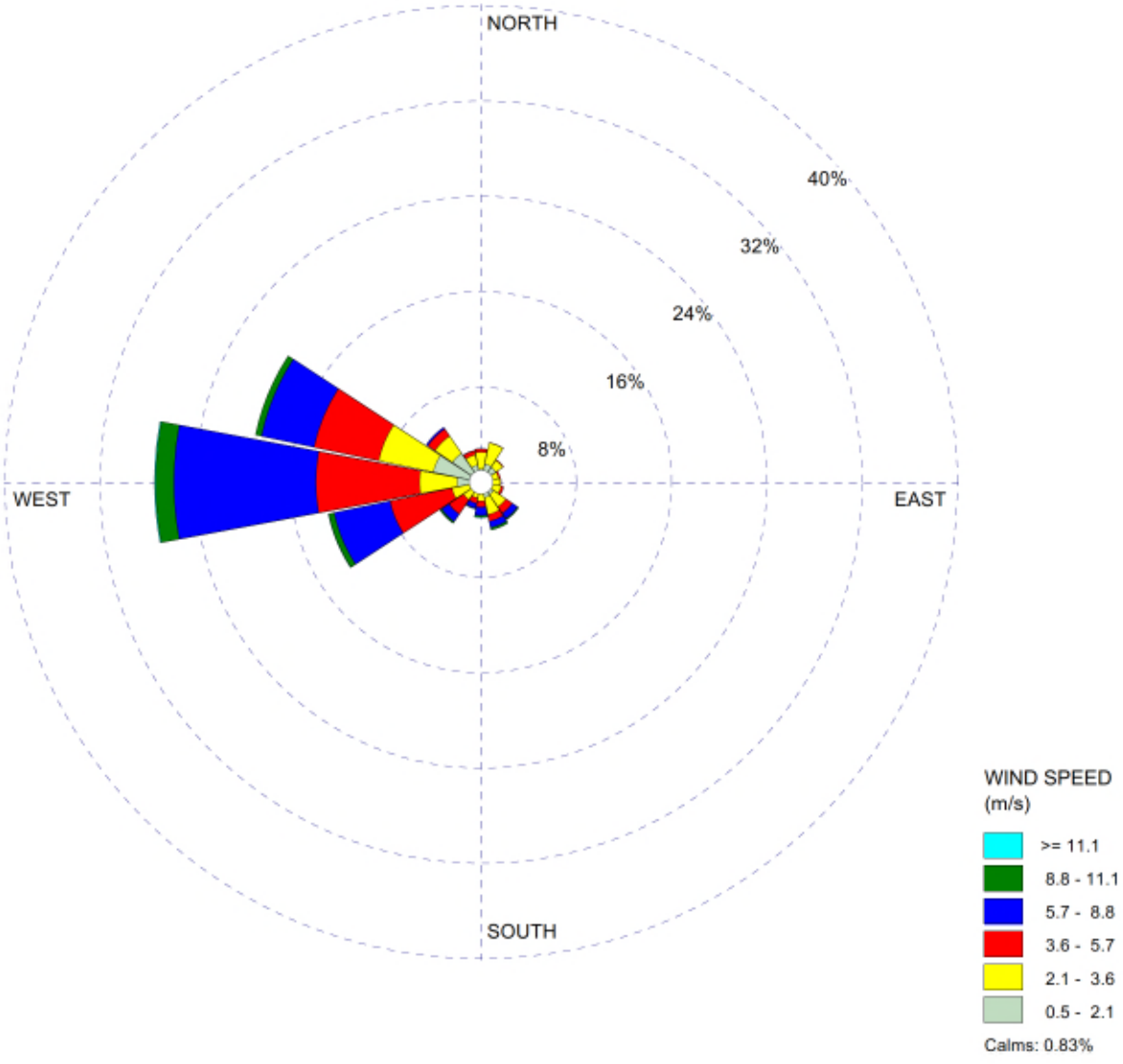
Wind Rose

WIND ROSE PLOT:

Annual Meteorological Conditions
Automated Waste Collection System

DISPLAY:

Wind Speed
Direction (blowing from)



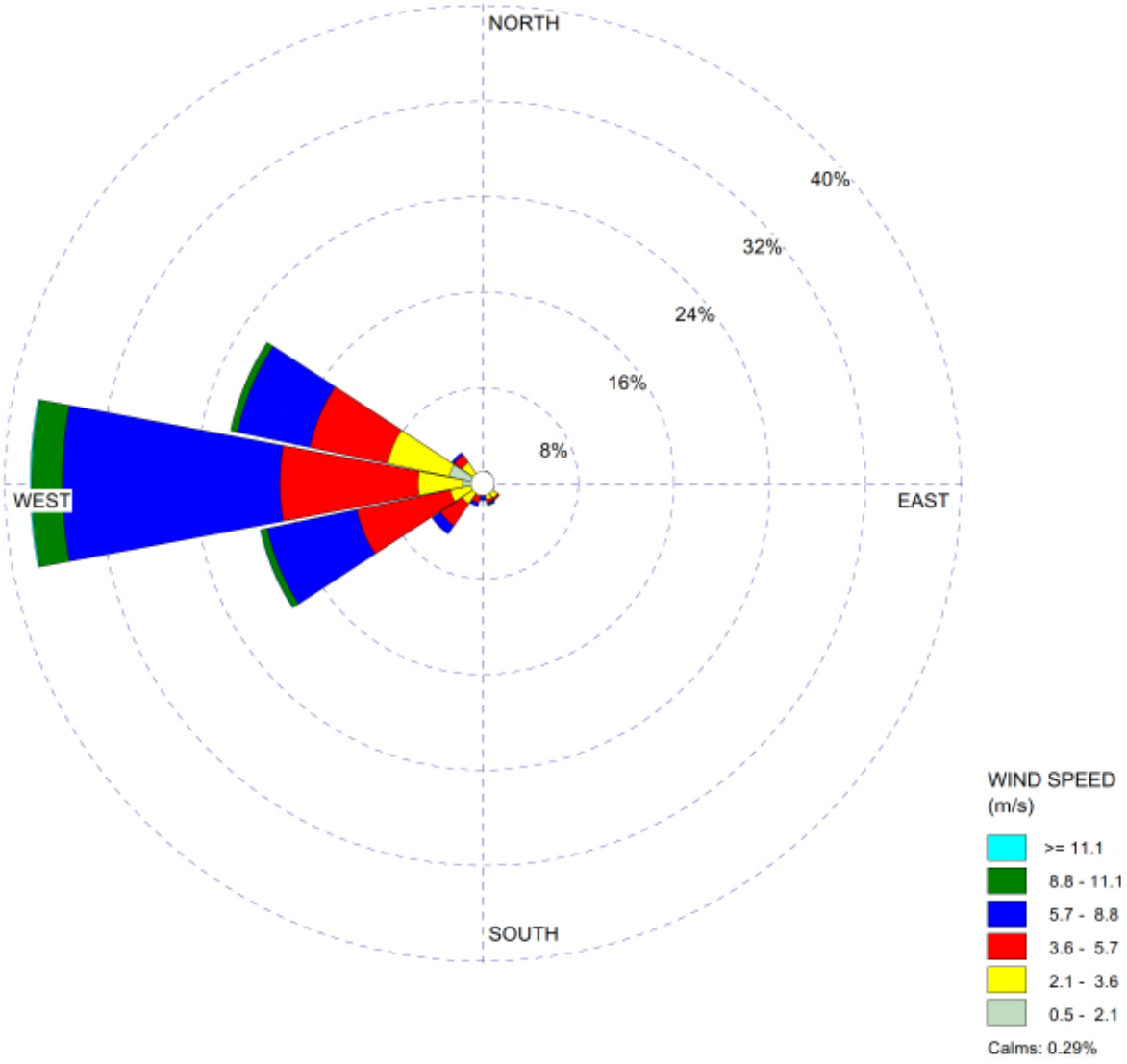
LOCATION:	DATA PERIOD:	COMPANY NAME:	
Candlestick Point-Hunters Point Shipyard	**Start Date: 10/1/2002 - 00:00** **End Date: 9/30/2003 - 23:00**	**ENVIRON International Corporation**	
		MODELER:	
	CALM WINDS: **0.83%**	TOTAL COUNT: **8760 hrs.**	
	AVG. WIND SPEED: **3.94 m/s**	DATE: **3/28/2014**	

WIND ROSE PLOT:

April - October Meteorological Conditions
Automated Waste Collection System

DISPLAY:

Wind Speed
Direction (blowing from)



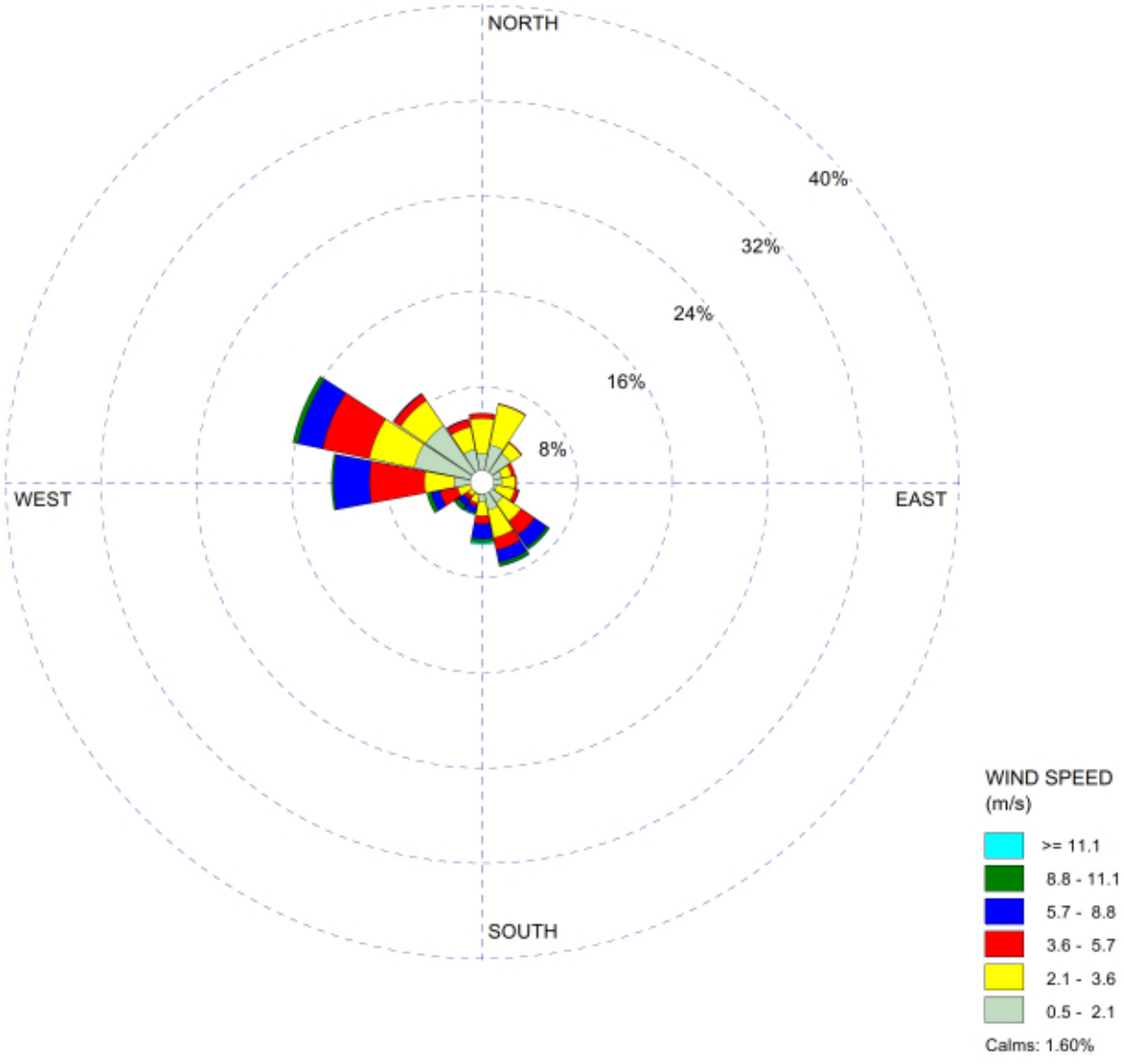
LOCATION:	DATA PERIOD:	COMPANY NAME:	
Candlestick Point-Hunters Point Shipyard	**Start Date: 10/1/2002 - 00:00** **End Date: 9/30/2003 - 23:00**	**ENVIRON International Corporation**	
		MODELER:	
	CALM WINDS: **0.29%**	TOTAL COUNT: **5136 hrs.**	
	AVG. WIND SPEED: **4.68 m/s**	DATE: **3/28/2014**	

WIND ROSE PLOT:

November - March Meteorological Conditions
Automated Waste Collection System

DISPLAY:

Wind Speed
Direction (blowing from)



LOCATION:	DATA PERIOD:	COMPANY NAME:	
Candlestick Point-Hunters Point Shipyard	**Start Date: 11/1/2002 - 00:00** **End Date: 3/31/2003 - 23:00**	**ENVIRON International Corporation**	
		MODELER:	
	CALM WINDS: **1.60%**	TOTAL COUNT: **3624 hrs.**	
	AVG. WIND SPEED: **2.89 m/s**	DATE: **3/28/2014**	

Appendix C

Contact Sign

For questions or complaints, please contact:

Recology [Contact Name]

Recology [Contact Phone Number]

Bay Area Air Quality Management District: 1-800-334-6367

Appendix D

Log of Sweeping Activities

Sweeping Log

Date of Sweeping	Method of Sweeping	Description of products used to mitigate odors, if any

Appendix E

Odor Complaint Response Survey Form

Odor Survey Form

Complaint Information

Address of Complainant: _____ Time of Complaint: _____ Date of Complaint: _____

Odor Survey Information

Name of Inspector: _____ Time of Survey: _____ Date of Survey: _____

Indicate the locations surveyed: _____

If an odor is detected during the survey, identify:

Location of odor: _____

Time when odor detected: _____

Duration of odor: _____

Description of odor character: _____

Frequency of detected odor (circle one): single occurrence quarterly monthly weekly daily

Intensity of odor (circle one): very light light moderate strong very strong

Describe the odor source (if identified). If possible, identify specific cause of odor (i.e., specific compound, equipment, process, plant upset, etc.): _____

Have odors been detected at this location at different times? If so, compare previous and current odor observations: _____

Other notes: _____

_____

_____

_____

Weather Conditions During Odor Survey

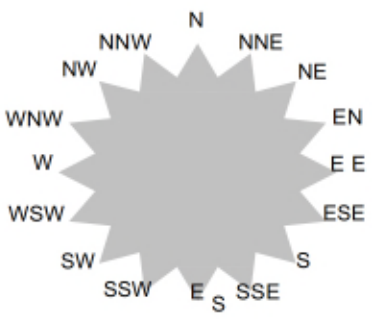
Weather conditions: ☐ Clear sky / sunny ☐ Partially cloudy ☐ Overcast ☐ Rain

Temperature: _____°F Relative Humidity: _____%

Wind speed: ☐ Light breeze (1-5 mph) ☐ Moderate wind (5-15 mph) ☐ Strong wind (15+ mph)

Wind direction (direction from):

(circle one)



Appendix F

Log of Odor Complaints

Odor Complaint Form

Contact Information

Complainant Name: _____ Telephone Number: _____

Address: _____ E-mail Address: _____

General Information

Date complaint received: _____

Time complaint received: _____

Location where odor detected: _____

Date when odor first detected: _____

Time(s) when odor detected: _____

Duration of odor: _____

Description of odor character: _____

Alleged source of odor: _____

Frequency of detected odor (circle one):	single occurrence	quarterly	monthly	weekly	daily
Intensity of odor (circle one):	very light	light	moderate	strong	very strong

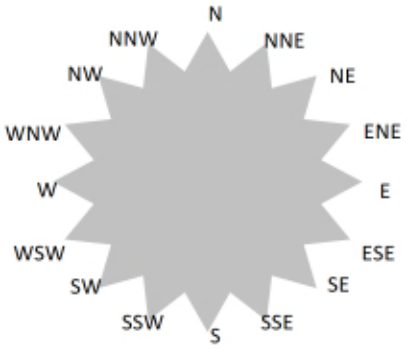
Weather Conditions During Time When Odor First Experienced by Complainant

Weather conditions: ☐ Clear sky / sunny ☐ Partially cloudy ☐ Overcast

Temperature: _____°F Relative Humidity: _____%

Wind speed: ☐ Light breeze (1-5 mph) ☐ Moderate wind (5-15 mph) ☐ Strong wind (15+ mph)

Wind direction (direction from):
(circle one)



April 24, 2014

MEMORANDUM

To: Joy Navarrete, Planning Department, City and County of San Francisco

From: Kevin Warner
Kristen Wallace

Cc: Therese Brekke, Lennar Urban

Subject: Noise and Vibration Impact Assessment for the Automated Waste Collection Systems in the Candlestick Point-Hunters Point Shipyard Phase II Development Plan
Planning Department Case File No: 2007.0946E

Introduction

The Environmental Impact Report (EIR) for the Candlestick Point – Hunters Point Shipyard Phase II Development Plan (San Francisco Planning Department Case Number 2007.0946E) was certified by the City in June 2010. The 2010 EIR analysis included discussion of an Automated Waste Collection System (referred to herein as AWCS) in the Utilities Variant. The project sponsor, Lennar Urban, is seeking approval of the AWCS and additional details about the design are now available. This memorandum evaluates noise and vibration impacts of the proposed AWCS in light of the analysis and conclusions reached in the 2010 EIR.

Project Description

The AWCS is a type of waste collection. Instead of implementing the traditional method where waste trucks pick up trash on the side of the road, users will deposit their waste into inlets to an underground distribution network that leads to the AWCS Facility.

Separate inlets for regular trash, recycling items, and compostables will be located in every building and at appropriate public locations. Waste would enter the underground distribution network of piping periodically throughout the day. The pipe transports waste using vacuum pressure and air velocity created by electrically powered large suction fans. Once the waste reaches the facility, the waste is separated from the transport air with a cyclone separator. The waste is then compacted with a compactor feed hopper and stored in separate 40 cubic yard containers, one for each waste stream – trash, recycling and compostables. When the containers of waste are full, trucks will transport the full container to either Recology's Tunnel Beatty Site (for trash and compostables) or their recycling facility at Pier 96 (recycling). An estimate of seven trucks per day would be needed to transport the full containers. The fans and other collection equipment will be fully enclosed within buildings. One collection facility will be located on top of the parking garage for the retail center in Candlestick Point at the southwest corner of the intersection of Arelious Walker Way and Ingerson Avenue. The other two collection facilities will be located in Hunters Point Shipyard – one near Crisp and Ring Roads in a Research and Development area and one at Spear Avenue near C Street in a Research and

Development area. Before the construction of the AWCS facilities is complete, Recology will handle waste collection using its current waste cart and collection truck methods.

Construction

The 2010 EIR identified three construction related noise and vibration impacts:

- *Impact NO-1(a-c): Construction activities associated with the Project would generate increased noise levels for both off-site and on-site sensitive receptors; however, the Project's construction noise impacts would occur primarily in noise-sensitive areas adjacent or near to active construction sites (which would vary in location and duration over the entire period the proposed Project would be under construction); they would also not occur during recognized sleep hours, and would be consistent with the requirements for construction noise that exist in Sections 2907 and 2908 of the Municipal Code. (Less than Significant with Mitigation)*

- *Impact NO-2(a-c): Construction activities associated with the Project would create excessive groundborne vibration levels in existing residential neighborhoods adjacent to the Project site and at proposed on-site residential uses should the latter be occupied before Project construction activity on adjacent parcels is complete. Although the Project's construction vibration impacts would be temporary, would not occur during recognized sleep hours, and would be consistent with the requirements for construction activities that exist in Sections 2907 & 2908 of the Municipal Code, vibration levels would still be significant. (Significant and Unavoidable with Mitigation)*

- *Impact NO-3: Construction activities associated with the Project would result in a substantial temporary or periodic increase in ambient noise levels. (Significant and Unavoidable with Mitigation)*

The construction noise and vibration impact assessment described in the 2010 EIR included construction activities in the areas where the AWCS are proposed to be located. Thus, the construction impacts of the AWCS were included in the 2010 EIR analysis. Consequently, the findings of the 2010 EIR for *Impact NO-1, Impact NO-2, and Impact NO-3* would not change based on the additional detail now available for the AWCS.

Operation

The 2010 EIR identified the following five noise and vibration impacts related to long-term operation of the Project:

- *Impact NO-4: Implementation of the Project, including the use of mechanical equipment or the delivery of goods, would not expose noise-sensitive land uses on or off site to noise levels that exceed the standards established by the City. (Less than Significant)*
- *Impact NO-5: Implementation of the Project would not generate or expose persons on or off site to excessive groundborne vibration. (Less than Significant)*
- *Impact NO-6: Operation of the Project would generate increased local traffic volumes that could cause a substantial permanent increase in ambient noise levels in existing residential areas along the major Project site access routes. (Significant and Unavoidable)*

- *Impact NO-7: Noise during football games and concerts at the proposed stadium would result in temporary increases in ambient noise levels that could adversely affect surrounding residents for the duration of a game or concert. (Significant and Unavoidable with Mitigation)*
- *Impact NO-8: Implementation of the Project would not expose residents and visitors to excessive noise levels from flights from San Francisco International Airport such that the noise would be disruptive or cause annoyance. (Less than Significant)*

Regarding *Impact NO-6*, the original Project analyses estimated over 500 trucks per day would be generated by the Project and is assumed to have included truck travel in a traditional waste collection system. The AWCS would not increase the truck travel on the main roads and would decrease travel on small residential roads. Thus, the impact of seven daily trucks (14 one-way trips) associated with each of the collection facilities were included in the EIR noise impact analysis, and the additional detail now available for the AWCS facilities would not change the conclusions of *Impact NO-6* regarding traffic noise levels. No further analysis of traffic-related noise is considered here.

Regarding *Impact NO-7*, the current Project does not include the stadium, and any noise impacts associated with the stadium are no longer relevant.

Regarding *Impact NO-8*, the original Project analysis assessed the potential for exposure of residents and visitors to excessive noise levels from flights to or from San Francisco International Airport. The inclusion of the AWCS facilities would replace the more traditional trash collection system for the developed area of the project site and would not change or influence the provision of residential or visitor uses in the project. Consequently, the AWSC facilities would not alter the conclusions identified in *Impact NO-8*.

Inclusion of the AWCS facilities could potentially alter the conclusions of *Impact NO-4* and *Impact NO-5*. Therefore, this supplemental assessment focuses on noise and vibration from operation of the AWCS potentially affecting nearby sensitive receptors. Below we describe the methods used in this supplemental noise and vibration impact assessment to determine whether the proposed AWCS facilities would result in any new significant noise or vibration impacts beyond those identified in the EIR or substantially increase the severity of a previously identified significant impact.

AWCS Noise Levels

To characterize the noise and vibration of the proposed AWCS equipment and processes, ENVIRON visited an AWCS collection facility at Swedish Medical Center in Issaquah, Washington. The Swedish Medical Center system is similar to, though smaller than, the AWCS facilities proposed for the Candlestick Point and Hunter's Point developments.

Fan Room – The fan room of the Swedish Medical Center AWCS contains two 100 horsepower (hp) fans and a compressor. When the fans and compressor were operating at full power, the measured sound level inside the fan room was 88 dBA. Because the proposed AWCS facilities at Candlestick Point and Hunter's Point are expected to contain four 250 hp fans and two compressors, the sound level inside the proposed fan rooms could be as high as 7 dBA louder than measured at the Swedish Medical Center facility, resulting in an estimated sound level of 95 dBA inside the fan rooms.

The following design features are expected to reduce the sound levels of the fans and compressors at locations outside of the Candlestick Point and Hunter's Point AWCS facilities:

- The fan rooms would be contained within the larger AWCS buildings
- The walls of the fan rooms are proposed to be constructed of filled concrete block
- The fans would be wrapped with acoustical blankets
- The fans would be connected to the ducting with resilient collars
- Fan exhaust would travel through a silencer, several filters, and an acoustic louver prior to exiting outside

Exhaust Louver – Each AWCS facility would include an exhaust louver on the outside wall of the facility. The measured sound level of the exterior exhaust louver during full operation of the fans at the Swedish Medical Center was 51 dBA at 25 feet (adjusted from 60 dBA at a distance of 8.5 feet).

Waste Collection Area – The collection areas of the proposed AWCS facilities would include four compactors/cyclones and ducting through which the collected material would travel. During the visit to Swedish Medical Center, ENVIRON measured a sound level of approximately 75 dBA at 25 feet due to trash flowing through ducting. However, this activity occurs only sporadically (assumed to be 5 minutes or less per hour), and the hourly L_{eq} was estimated to be approximately 64 dBA at 25 feet. [1]

The sound level of the compactors was provided to ENVIRON by TransVac and is estimated to be approximately 57 dBA at 25 feet. For this assessment, the compactors were assumed to operate continuously, although they are not compacting trash the majority of the time.

The collection areas would be enclosed within the AWCS buildings but would include two sliding doors to allow truck access to the waste containers. The doors would remain closed until trucks arrive to remove full waste containers or to deliver empty containers.

Noise Model

ENVIRON conducted noise modeling of the AWCS facilities using Datakustik's CadnaA noise model, version 4.3.143, based on ISO 9613-2 calculation methods. CadnaA is similar to the model used in the EIR (SoundPLAN) and considers frequency-specific sound level data, topography, intervening buildings, barriers, atmospheric conditions, and other factors. The model allows the user to input frequency-specific sound level data based on measurements or manufacturer specifications.

Using source data captured at the Swedish Medical Center AWCS and/or provided by TransVac, ENVIRON modeled the sound levels of the three proposed AWCS facilities Candlestick Point and Hunter's Point. Noise model receptors were selected based on proximity of sensitive uses to the proposed AWCS facilities. Modeled levels were predicted at the nearest existing off-site residential receivers, nearest proposed on-site residential receivers, and if applicable, nearest non-residential noise-sensitive receivers.

[1] The L_{eq} is the constant sound level that would contain the same acoustic energy as the varying sound level during the same time period (i.e., the average noise exposure level for the given time period).

Noise Standards

As for the noise assessment conducted for the EIR, ENVIRON compared the modeled sound levels to the noise standards established by the City of San Francisco (section 2909 of the San Francisco Noise Ordinance). For dwellings, the City applies a noise limit of 45 dBA between 10 PM and 7 AM (55 dBA between 7 AM and 10 PM) at locations inside a sleeping or living room. For this assessment, we assumed the windows would be open for ventilation and applied the noise limit at the exterior wall of the nearest dwellings. We also assumed the facilities could operate day or night, and applied the more restrictive nighttime noise limit of 45 dBA at the nearest dwellings. The City noise limits are applied to specific facility-related noise, not to the overall noise levels (i.e., not to the existing ambient levels plus the Project noise).

The City Noise Ordinance also restricts increases over ambient noise levels to 5 dBA when emanating from a residential use or 8 dBA when emanating from a commercial/industrial land use. Because this is a commercial use, the increase would be restricted to 8 dBA at neighboring properties. Existing ambient sound levels were based on the measured off-site ambient levels identified in the EIR. The ambient noise level can be established through measurement, but in no case shall it be considered to be less than 45 dBA in exterior locations.

Model Results and Conclusions

Using the equipment sound level assumptions identified above, ENVIRON modeled the sound levels of the AWCS facilities at the Candlestick Point, Hunter's Point South, and Hunter's Point North facilities. Results of the AWCS noise modeling assessment are summarized in **Table 1**.

Table 1. Noise Modeling Results, AWCS at Candlestick Point and Hunter's Point (dBA)

AWCS Location	Receiver Type	Ambient Levels (dBA, L_{90}) [a]	Modeled Levels (L_{eq}, dBA)[b]			Notes
			AWCS	Overall	Increase	
Candlestick Point	Nearest Proposed On-Site Residence	46	**38**	47	1	Approximately 110 feet north of the AWCS facility
	Nearest Existing Off-Site Residence	46	**21**	46	0	Approximately 500 feet northwest of the AWCS facility
	Nearest Proposed Commercial	46	**43**	48	2	Movie Theater, approximately 50 feet south of the AWCS facility
Hunter's Point South	Nearest Off-Site Residence (under construction)	45	**29**	45	0	Approximately 200 feet northwest of the AWCS facility
Hunter's Point North	Nearest Proposed On-Site Residence	45	**32**	45	0	Approximately 110 feet northwest of the AWCS facility

Note: Apparent mathematical errors in the displayed increase are due to rounding to the whole number, not due to calculation errors.

[a] The ambient level at the locations near the Candlestick Point development was considered to be the lowest of the measured ambient levels (identified as 46-50 dBA) at location N6 in EIR Table III.1-4. The ambient level near the Hunter's Point developments was considered to be 45 dBA, since most of the measured levels identified for location N3 in EIR Table III.I-4 were less than 45 dBA.

[b] Because the analysis assumed most of the equipment would operate continuously at full capacity, the modeled hourly L_{eq} levels can be considered similar to the L_{90} levels (i.e., the level exceeded 90% of the time). The only exception is the sound from trash traveling through the ducts in the collection facility. The L90 level would not include this activity since it would occur less than 90% of an hour (i.e., less than 6 minutes per hour), but the modeled hourly L_{eq}s include some of this sound energy. Therefore, the results can be considered conservative.

As shown in **Table 1**, the modeled sound levels of the AWCS facilities at the nearest existing or proposed residential dwellings to each proposed facility are 43 dBA or less. This would comply with the City's interior nighttime noise limit of 45 dBA applied to specific Project-related noise. Additionally, note that predicted sound levels are at the outside plane of a window, and not inside a living space. It is expected that, even with windows open, interior levels would be slightly lower than outside the building envelope.

In addition, the estimated increases over ambient levels at the nearest sensitive receivers to each site are 2 dBA or less, which would comply with the City's restriction on increases to 8 dBA or less due to commercial/industrial uses.

Based on the above, noise levels are expected to comply with the San Francisco Municipal Code, and thus the impact would be less than significant. These findings are consistent with the findings outlined in *Impact NO-4.*

Waste Collection Noise Levels

As part of this review, ENVIRON also considered potential noises associated with the collection of the waste containers at the AWCS facilities. To characterize these sources, ENVIRON observed and measured a container pickup and drop-off at two different sites. Both the pickup and drop-off included brief, loud noises from the arrival and departure of a diesel truck, brake releases, the truck engine revving to lift the bed of the truck and pull up or lower the container, minor clanks and bangs, and the truck engine idling while the driver prepared the container for pickup or release.

Because the waste collection truck is not a fixed source, it would not be subject to the interior noise limits for residences as identified in section 2909 of the San Francisco Noise Ordinance (i.e., 55 dBA during the day and 45 dBA at night inside sleeping or living rooms). Furthermore, because the collection noise would occur only for short periods during the seven container pickups/drop-offs daily, it would not affect the ambient levels (as characterized by the L_{90} in the EIR).[2] Therefore, although the waste collection activities would produce brief, loud noises, these types and levels of noise would fall within the range of ordinary urban noise and would not result in significant noise impacts. These findings are consistent with the findings outlined in *Impact NO-4* as regard waste collection activities.

AWCS Vibration Levels

During ENVIRON's visit to the Swedish Medical Facility AWCS, there were no noticeable vibrations inside the fan room from the fans or any other equipment. The fans were mounted on an isolation base along with shock isolators that were attached to the floor. The mass of the base in conjunction with the shock isolators attenuated vibrations that may have been transmitted to the floor. These same design features will be used at the Candlestick Point and Hunter's Point AWCS facilities. Therefore, operation of the AWCS facilities would not generate or expose persons on or off site to excessive groundborne vibration and any impact would be less than significant. This finding is consistent with the finding outlined in *Impact NO-5.*

[2] The L90 is the level exceeded 90% of the time, or 54 minutes of any hour. A container pickup/drop-off would occur for less than 15 minutes of any hour.

AUTOMATED WASTE COLLECTION SYSTEM DETAILS

Description of Components of the AWCS

Users of the system deposit their waste into labeled waste inlets. In the case of buildings, waste would enter the system in a similar manner to what would typically be used in modern multiple story buildings. The building would be constructed with waste chutes. Occupants would deposit waste into chutes through inlets located on every floor of every building. In outdoor areas, waste deposited in street receptacles would be picked up in the normal manner by the City's permitted waste hauler. Waste deposited in park areas would be picked up by park maintenance crews using carts and bags, and taken to a central location and deposited into the AWCS system.

Once the waste is deposited into the system through the inlets, it drops into a sealed chamber located below the inlets which holds the material in place until an electronically controlled valve opens and drops the material into the horizontal underground transport pipe network. If the holding chamber fills up before the next scheduled discharge time, a photo-detector activates the valve to release the waste to make room for additional waste that has been deposited in the system. After the waste drops into the pipe, the valve closes and powerful electric fans create air pressure which propels the waste at high speed through a sealed network of underground pipes to enclosed compactors and waste containers at a centralized collection facility. Once the waste is placed in an inlet it will neither be seen nor handled again until it is unloaded from collection trucks that will pick up the waste at each collection facility and take the waste to Recology's solid waste and recycling facilities at Tunnel and Beatty Roads and Pier 96. The holding chambers will be emptied at least once every 8 hours, and as noted above, if the chamber fills up prior to the next scheduled discharge, a photo-detector will trigger the emptying of the chamber.

The first of the three central collection facilities to be built will be sited on top of the parking garage at the Candlestick Point Retail Center (CP Center). It will be located at street level and accessed by a separate entrance from the garage. Adjacent to the collection facility at CP Center, movie theatres, residences, residential life care or hotel uses are proposed. This collection facility will be approximately 6,300 square feet. The building will range in height from 16 feet to 36 feet and would comply with the height, setback and bulk requirements in the Design for Development Program under the 65-foot height limit in Candlestick Point. See plans above and schematic below. The other two central collection facilities will be located at Hunters Point Shipyard along Crisp Road, and on Spear Avenue near B Street. Both locations are in areas designated for Research and Development activities. Collection facilities at both locations would range from 16 feet to 36 feet, and would similarly comply with the Design for Development requirements under their respective height limits of 65 and 85 feet.

The main network of underground pipe is comprised of 20-inch inside diameter heavy gauge steel pipe that is welded, poly-wrapped and buried within the street rights-of way pursuant to a Major Encroachment Permit approved by the Board of Supervisors. The thicknesses of the pipe will vary from 3/8-inch to 1-inch based on pipe layout geometry of branches and bends.

Buried concrete access vaults at pipe branch locations will provide repair and maintenance access to underground piping on an as-needed basis. Air-flow isolation valves will be incorporated to shut-off branches from the main pipe network to improve efficiency and flow control.

All system components (e.g., dampers, diverters, fans) will be controlled by an electronic automated control system that continually monitors the operations of the entire AWCS system 24 hours a day. These sophisticated electronic system controls allow maintenance personnel to monitor, operate, and if needed, troubleshoot the system.

The installation of the system will be phased with the development of the Project. Accordingly, initial operations will not commence until the first Centralized Collection Facility has been completed in Candlestick Point in Sub-Phase CP-02. Prior to completion of this central collection facility, waste collection will be handled by Recology using its current waste cart and collection truck methods. Until the AWCS is fully operational, waste will be deposited in the chutes which will empty into centralized waste carts in the building, and will be periodically emptied by Recology. After the system is phased in, the waste will empty directly into the sealed chambers under each building, where the waste will empty into the pipe system and be transported to the central collection facility.

Waste inlets will be accessible 24 hours a day. The aperture of waste inlets will be smaller in diameter than chutes and transport pipes to help minimize the risk of clogs in the system. Storage chamber valves are normally closed and open only as scheduled throughout the day, but "photo eye" detectors allow the automated control system to override standard collection timing if larger than expected volumes of waste accumulate in a holding chamber. All valve assemblies have pressurized ventilation mechanisms that exchange air in the vertical chute risers and underground chambers to prevent the accumulation of odors in buildings.

During AWCS waste transport, powerful electric fans ramp up quickly and an air valve located upstream of the branch in which the waste is travelling opens to create the high-velocity airflow necessary to transport the waste directly to the appropriate enclosed central collection facility. Each type of material - landfill, recyclable, and compostable material- is piped from the waste inlets to the central collection facility into dedicated cyclone separators which slow the air and allows waste materials to drop into compactors that are tightly sealed to the cyclone separators. These compactors compress the waste into attached portable 40 cubic yard metal containers for transport by Recology. The exhaust air from the separators passes through a multi-stage, dry filtering system to remove particulates before exiting to the outside air.

When a container is full, it is disconnected from the AWCS compactor by Recology operators. Recology operators then load the full container onto a Recology truck for transportation directly to the San Francisco solid waste transfer station at Tunnel and Beatty Roads or the recycling facility at Pier 96. Once there, Recology will unload the contents of each container, wash the container, and return and reconnect it to the AWCS system. The full containers remain completely sealed during transportation to and from the transfer station and recycling facility.

At the Central Collection Facilities, the Recology trucks are programmed to cut off the vehicle's engine after five minutes to minimize idling times.

For the first central collection facility to be located atop the retail parking garage in Candlestick Point, trucks will enter and exit the site by way of a dedicated driveway at street level off Arelious Walker Drive. Trucks will leave the site by turning left onto Arelious Walker Drive from the site's driveway, on to Harney Way and then toward US 101. Trucks destined for the San Francisco solid waste transfer station at Tunnel and Beatty Roads would use Beatty Road to access the facility. Trucks destined for the recycling facility at Pier 96 would enter US 101 northbound from Harney Way, and immediately exit at the Paul Avenue/Third Street off-ramp. Trucks would travel northbound on Third Street to Cargo Way, and then east on Cargo Way to Pier 96. Trucks would enter the site using similar routes. Truck trips would typically occur between 6 AM and 11 AM, and would not affect peak period traffic conditions. A total of 14 truck trips are anticipated for this facility; seven trucks to and from the site daily.

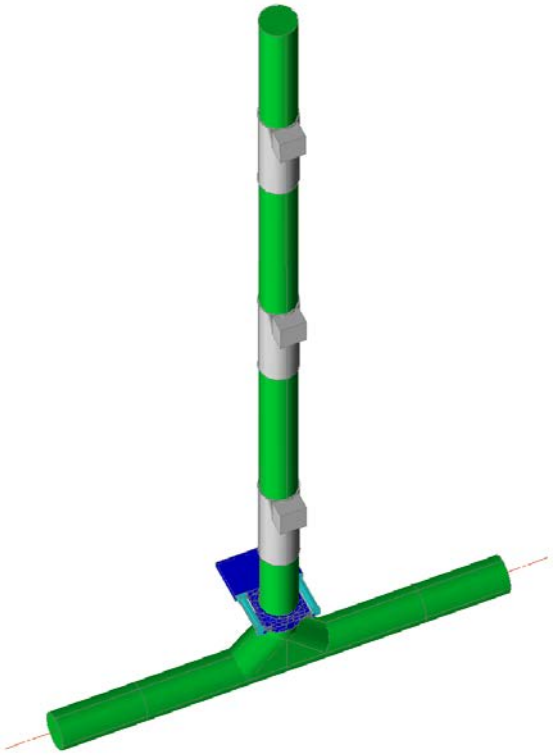


ILLUSTRATION OF BUILDING INLETS

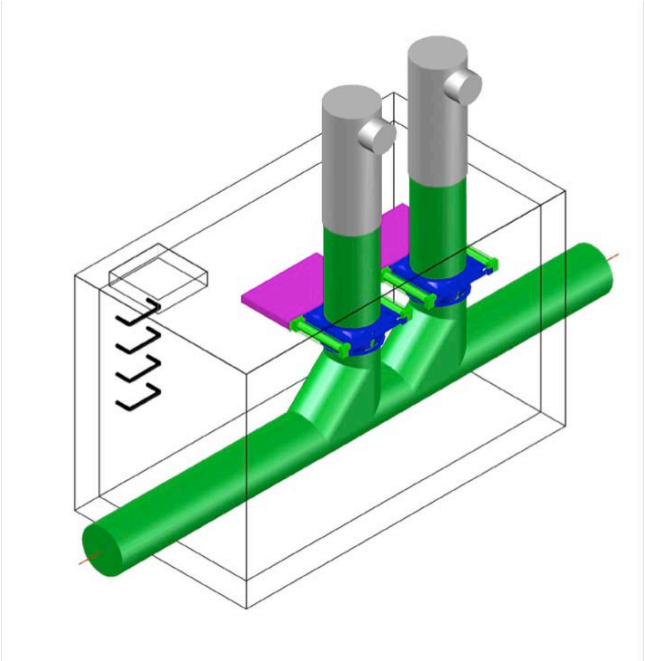


ILLUSTRATION OF STREET LEVEL INLETS

For the two additional Hunters Point Central Collection Facilities, the same number of truck trips is anticipated during the same off-peak time period. For trucks traveling between the San Francisco solid waste transfer station and the site located in Hunters Point South Parcel 1, trucks would travel along Third Street, Palou Avenue, and Crisp Road, entering the site from the diagonal road connecting Crisp Road and Fisher Street. Trucks traveling between the San Francisco solid waste transfer station and the site located in Hunters Point Research and Development Parcel 4 would use the same route, but would continue on to Fischer Street and Spear Street to the entrance located on Spear Street near "B" Street.

For trucks traveling between the recycling facility at Pier 96 and the site located in Hunters Point Research and Development Parcel 4, trucks would travel along Jennings Street, Evans Street, Hunters Point Boulevard, Innes Avenue, Donahue Street, Lockwood Avenue, and Spear Street to the entrance located on Spear Street near "B" Street. Trucks traveling between the recycling facility at Pier 96 and the site located in Hunters Point South Parcel 1 would use the same route, but would turn from Lockwood Avenue onto Fischer Street, and then to the diagonal street connecting Fischer Street and Crisp Avenue.

In an emergency situation involving the loss of power for an extended period, Recology would provide alternative garbage collection for the Project site as necessary and feasible given the emergency conditions.

<u>System Components: Loading Points/Inlets</u>

Inlets will be at a height and size that would eliminate the possibility of small children accessing the system for disposal of items or falling into the system. In buildings, the design is similar to traditional gravity chutes in San Francisco buildings. Upon receiving building plans from individual building architects, TransVac will work with them to design the gravity chutes appropriate for each building.

These chutes will connect to the AWCS and will comply with the relevant City and State code sections applicable to gravity chutes.

Inlets in public parks will have secured inlets so they are only accessible to City maintenance workers. The size of the openings on these inlets will be no more than 14 inches in diameter in order to limit the size of waste deposited into the system.

Although very unlikely, any fire that occurs in any of the system's inlets will be extinguished by the fire sprinkler system in the vertical chute. This is same protocol required by the Fire and Building Codes for gravity chutes throughout San Francisco. The risk of fire in the piping system is highly unlikely due to the negative pressure of the AWCS. Furthermore, there is very little dwell time of the waste in the piping system, making fire even more unlikely.

Recology is the owner and operator of the AWCS, and has contracted maintenance to TransVac. The control system monitors all access points. If any valve does not open or is stuck, an alarm is sent to the main control system. The rest of the system will continue to operate. To prevent clogs from slowing down the waste movement, a clog detection system will send a signal of low airflow if a clog develops. The control system will run a clog removal sequence. If that is unsuccessful, the system will be cleared manually via maintenance vaults.

Piping Network *(see illustrations above)*
Underground piping will be heavy wall mild steel with a protective poly-wrap to protect the buried pipe from subsurface soil conditions and contaminants that may be present. When piping goes above ground, lighter gauge steel may be utilized.

The primary alignment of the TransVac system is under the sidewalk area, and would be below any utilities that have lateral pipes crossing perpendicularly. The system is approximately 9-10' deep in all areas except for a short stretch at Arelious Walker where it is somewhat less deep. In all areas any service laterals will be above the TransVac line.

Air Inlets
Air inlets provide a means for air to be drawn into the piping network in sufficient quantities to allow for material transport. An air inlet may or may not include an inlet damper depending on location and orientation. Air inlets are located upstream of waste inlets and can be located at any desired location. The control system manages the opening and closing of the air inlets.

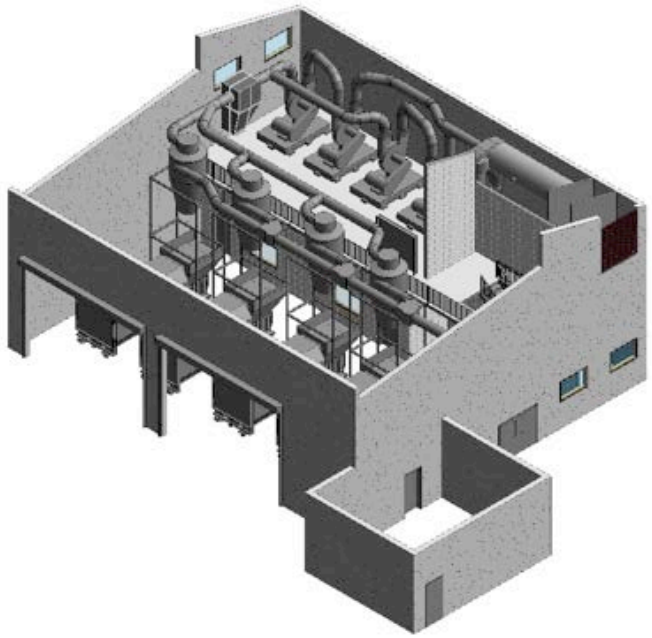
Isolation Dampers *(valves)*
Only one branch of the AWCS operates at a time. Isolation dampers are installed at branch intersections and are closed if a branch is not being actively used.

Central Collection Facilities
Each Central collection facility will house fan units, one cyclone waste separator for each waste stream, a multi-stage filtering system, compactors and containers. While specific designs for the collection facilities to be located in the Hunters Point portion of the Project Area will be completed at a later time in

accordance with the Project construction phasing schedule, they will be similar in massing and height to the Candlestick Point Collection Facility. The Candlestick Point collection facility's equipment and electric power requirements are summarized in Table 1 below. It is expected that the equipment and electricity consumption for the Hunters Point Collection Facilities would be similar. All equipment used in the central collection facilities is electric.

Table 1
Collection Station Equipment and Power Requirements

Equipment	Power Requirement
(2) 250 HP Fans	~260 kVA
(1) air compressor	~6.9 kVA
(1) air dryer	~2.8kVA
(1) compactor unit	~7.5 kVA
Controls System	~2.4 kVA
Furnace, lighting, etc.	~2.5 kVA
Collection Station Total	~280 kVA



CANDLESTICK POINT COLLECTION FACILITY RENDERING

Cyclone Separator

When waste first enters a cyclone, the waste separates from the air. Air passes through the cyclone while the waste material drops out of the bottom into the attached compactor in-feed hopper. The released air passes through a multi-stage filtering system to remove large materials such as paper and plastic bags.

All air in the AWCS is completely contained within the system and will not mix with outside air before being conveyed through the multi-stage filtering system and exhaust louvers.

Air Filtering

As mentioned above, exhaust air passes through a multi-stage filtering system to remove particulates, odor and all visible constituents. The filtration system employed by TransVac will remove at least 99.6% of particulates in the 3–10 micron range. The filtration system will achieve Bay Area Air Quality Management District's (BAAQMD) Best Available Control Technology (BACT) limit of 0.01 grains per dry standard cubic foot (gr/dscf) and achieve an emissions rate of not more than 27.2 lbs/day as discussed in the Air Quality section below. Once the AWCS is operational, Recology will conduct initial testing of exhaust air for PM10 emissions to ensure the emissions do not exceed this estimated rate. Recology will also develop an Operation Plan for the AWCS which will include a periodic monitoring schedule for testing air emissions from the AWCS. Testing results will be submitted to the San Francisco Department of Public Health (SFDPH) in its role as the Local Enforcement Agency under CalRecycle (LEA) within 30 days of receipt of final testing results.

Construction Process

Through an installation sequence coordinated with the Project Sponsor, a network of buried steel pipe will be installed in the assigned right-of-way at the same time other utility lines are installed during each phase of development. A network of streets and access lines to individual parcels throughout the Project Site has been reserved for the AWCS implementation. The Department of Public Works, with the approval from the Board of Supervisors, would issue a Major Encroachment Permit to Recology for use of those streets and prior to the commencement of construction of the AWCS. See graphics on p. 5.

Branch piping will be installed to planned end locations (e.g., on private property) and, wherever possible, branch piping stub-outs will be installed for future connections. Based on material volume projections, loading stations will be located as needed within all buildings and outdoor areas. Buried maintenance access vaults will be installed at branch locations to allow permanent access to underground piping.