4.8 GREENHOUSE GAS

4.8.1 INTRODUCTION

This section provides an overview of the existing greenhouse gas conditions within the project area and surrounding region, regulatory framework, and environmental analysis of potential air quality impacts that would result from implementation of the proposed project. Where necessary to offset, reduce or avoid potential effects, mitigation measures are provided. This section concludes with the discussion of residual project impacts [significance after mitigation] and cumulative impacts.

4.8.2 ENVIRONMENTAL SETTING

The project area is located in the Coachella Valley portion of the Salton Sea Air Basin (SSAB or Air Basin). The Coachella Valley portion of the SSAB is typical of a low desert climate, with summer daytime temperatures that can exceed 110°F and drop into the 20's during winter nights. The Valley floor receives an average of four to six inches of rainfall per year with greater precipitation at higher elevations.

4.8.2.1 Climate Change and Greenhouse Gases

Air pollution is a chemical, physical or biological process that modifies the chemistry and other characteristics of the atmosphere. The primary contributor to air pollution is the burning of fossil fuels used in transportation, power and heat generation, and industrial processes. The byproducts from the combustion of fossil fuels can contain a number air polluting substances. These emissions are responsible for the poor air quality that is evident in industrial centers worldwide.

Some air polluting agents are also greenhouse gases such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride), which are released into the atmosphere through natural processes and human activities. These gases are termed greenhouse gases due to their shared characteristic of trapping heat, and are believed to be responsible for the global average increase in surface temperatures of 0.7-1.5 °F that were observed during the 20^{th} century. More recently, the concentration of CO_2 in the atmosphere had increased by 42%, methane by 15%, and NOx by 9% from 1990 to 2010.

Carbon dioxide is the primary greenhouse gas that has raised the most concern of atmospheric scientists due to current atmospheric levels, current and projected emission levels, and the highly correlated temperature regression curve that has been observed, predicting a future path of rising carbon dioxide levels. Currently (2015), carbon dioxide concentrations in the atmosphere are around 400 parts per million (ppm). Comparatively, prior to the Industrial Revolution about 250 years ago, CO_2 levels were 278 ppm, and over the past 650,000 years carbon dioxide levels have fluctuated between 180 and 300 ppm, making present day atmospheric CO_2 levels substantially greater than at any point in the past 650,000 years.

In 2004 the State of California generated 492 million metric tons (MT) of carbon dioxide equivalent (CO_{2e}). In 2013 the State of California generated 459.3 million MT of CO_{2e}, representing an overall decrease of 7% since 2004 (CARB 2015). During the 2000 to 2013 period, per capita GHG emissions in

California have continued to drop from a peak in 2001 of 14.0 MT per person to 12.0 MT per person in 2013; representing a 14% decrease. GHG emission reductions are attributed to energy conservation measures such as use of more fuel-efficient vehicles, energy efficient appliances and building materials that are prescribed under Title 24 of the California Building Code.

4.8.3 REGULATORY FRAMEWORK

4.8.3.1 Federal Regulation

There are no federal regulations or requirements pertaining to GHG emissions that apply to the project.

4.8.3.2 State Regulation

California was the first state to establish regulations that require the reduction of emissions of GHGs from motor vehicles. On September 24, 2004, the California Air Resources Board adopted a bill that requires all motor vehicles of 2009 vintage or later to reduce their greenhouse gas emissions by about 30% by the year 2016. On June 1, 2005 Governor Arnold Schwarzenegger issued Executive Order S-3-05, which calls for reduction in GHG emission to 1990 levels by 2020 and for an 80% reduction below 1990 levels by 2050.

The California Global Warming Solutions Act (AB 32) was adopted by the State legislature in 2006. It sets forth a program to achieve 1990 emission levels by 2020 and requires CARB to proclaim 1990 GHG emissions and develop a Scoping Plan, which sets forth GHG reduction methods. CARB has reported that 1990 GHG emissions totaled 427 million metric tons (MMT) for the state of California; CARB adopted a GHG scoping plan on December 11, 2008. The Scoping Plan includes a cap and trade program, green building strategies, recycling and waste reduction, and Voluntary Early Actions and Reductions. More recently, Executive Order B-30-15 was issued by Governor Brown on April 29, 2015 establishing a new California goal to reduce greenhouse gas emissions to 40% below 1990 levels by 2030 ensuring the state would continue its efforts to reduce carbon pollution.

California SB 375 was signed by the Governor in September 2008 and is intended to at least in part implement greenhouse gas reduction targets set forth in AB 32. The bill encourages regional land use planning to reduce vehicle miles traveled and requires Metropolitan Planning Organizations (MPO) to adopt a sustainable communities strategy as part of their Regional Transportation Plan. The current reduction targets are 9% reduction by 2020 and a 16% reduction by 2035.

4.8.3.3 Local Regulation

In December 2015, the County of Riverside approved a Climate Action Plan (CAP). The CAP established goals and policies that incorporate environmental responsibility into its daily management of residential, commercial and industrial growth, education, energy and water use, air quality, transportation, waste reduction, economic development and open space and natural habitats to further their commitment towards reducing GHG emissions.

Riverside County has set a goal in accordance with AB 32 to reduce emissions back to 1990 levels by the year 2020. This target was calculated as a 15% decrease from 2008 levels, as recommended in the AB

32 Scoping Plan. The estimated community-wide emissions for the year 2020, based on population and housing growth projections associated with the assumptions used in the County's 2015 General Plan Update, are 12,129,497 MT CO2e. In order to reach the reduction target, Riverside County must offset this growth in emissions and reduce community-wide emissions to 5,960,998 MT CO2e by the year 2020.

In order to reach the reduction target, the County of Riverside would need to implement various state policies and the additional local reduction measures described in the County's CAP. These measures encourage energy efficiency and renewable energy in buildings, transit oriented planning, water conservation, and increased waste diversion. Riverside County does not have project- or region-specific thresholds for GHG emissions at this time. The CAP was challenged in January 2016. It is unclear how the litigation will impact the implementation of the CAP. However, at this time, the CAP is in full force and effect.

4.8.4 IMPACTS AND MITIGATION MEASURES

4.8.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, the project would have a significant effect on greenhouse gases if it were to:

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

4.8.4.2 Approach to Analysis

This section addresses greenhouse gas (GHG) emissions that would result from implementation of the proposed project. Construction-related and operational GHG emissions are evaluated quantitatively and then compared to the CEQA Air Quality Handbook of the South Coast Air Quality Management District (SCAQMD). GHGs and their contribution to climate change are a global issue, and this analysis qualitatively assesses the project's consistency with local and statewide GHG reduction policies.

South Coast Air Quality Management District Thresholds

The greenhouse gas impact analysis considers construction and operational impacts associated with the proposed project. Treatment facility operations and construction equipment, trucks, worker vehicles, and ground-disturbing activities associated with the project would generate emissions of criteria pollutants and greenhouse gas precursors.

An Air Quality Technical Report (Terra Nova Planning & Research, Inc., 2016) was prepared to evaluate air quality and greenhouse gas impacts associated with construction and operation of the proposed project. Quantitative analysis was prepared using the California Emissions Estimator Model Version 2013.2 (CalEEMod) computer program as recommended by the SCAQMD. CalEEMod incorporates CARB's EMFAC2011 model for on-road vehicle emissions and the OFFROAD2011 model for off-road

vehicle emissions. Separate emission runs were prepared for operation of the two CRRF facility treatment process options, including use of evaporation ponds and the brine crystallization process.

Determinations of significance for construction-related and operational greenhouse gas emissions were based on the comparison of project-generated emissions to applicable SCAQMD thresholds. The SCAQMD currently has one GHG threshold of 10,000 metric tons per year of $CO2_e$ for operation of industrial facilities. SCAQMD does not have a threshold for construction GHG emissions. Because the project includes industrial-type water treatment facilities, project-related operational greenhouse gas emissions were compared to the SCAQMD threshold of 10,000 metric tons per year of $CO2_e$. The significance of construction-related GHG impacts are also based on the SCAQMD threshold of 10,000 metric tons per year of CO2e, along with the project's consistency with adopted State and local GHG reduction measures. Further, SCAQMD staff recommends that construction emissions be amortized over a 30-year project lifetime, so that GHG reduction measures would address construction GHG emissions as part of the operational GHG reduction targets (SCAQMD 2008).

Greenhouse Gases Analyzed

Development and operation of the proposed project would result in a net increase in overall GHG emissions due to new energy demands and additional mobile source activities. For the purpose of this analysis, net new energy demands were analyzed to evaluate project-related GHG emissions. The emission of the following greenhouse gases are evaluated: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) and carbon dioxide equivalent (CO_2e), which includes a combination of hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

Construction emissions were computed based on the quantity, types, size and duration of equipment usage. The inventory of construction activity was combined with the equipment emissions factors that are used in the CalEEMod model. The construction schedule and equipment usage assumptions were provided by CVWD's design and construction management consultants (See Appendix B: Air Quality and Greenhouse Gas Technical Report for detailed assumptions.)

Operation emissions were computed from five emission source categories: Energy, Mobile, Area, Off-Road, and Water sources. Energy sources refer to direct and indirect use of fossil fuels for energy use, including electricity required for operation of the proposed facilities. It is assumed that natural gas would not be used as an energy source for project operations. Mobile sources refer to emissions associated with motor vehicle trips generated by employee commute and maintenance/delivery trips. Area sources refer to consumable products such as landscaping, building maintenance and cleaning supplies, and periodic reapplication of architectural coatings. Off-road sources refer to motor vehicle trip rates that may occur on un-paved roadways, such as disposal trips to wells sites. Water pumping refers to the GHG emissions associated with supplying and treating water and wastewater of the proposed treatment facilities. Detailed input assumptions and emission outputs for each source category are provided in Appendix B: Air Quality and Greenhouse Gas Technical Report.

CO_2e emissions from electricity demand were calculated based on the total project operational demand and the GHG intensity factors of the electricity utility provider. The proposed project is within the boundaries of two utility providers: Southern California Edison (SCE) and Imperial Irrigation District (IID). The majority of the project is within the service boundaries of IID, with the exception of the ID8 facility and several WBA and SBA well sites (which are located within the SCE boundary). For analysis purposes, energy demands from the ID8 treatment facility were modeled using the SCE GHG intensity factor, while

the remaining project energy demands were modeled using the IID GHG intensity factor. The GHG intensity factors are based on California Air Resources Board's (CARB) Local Government Operations Protocol (LGO), updated public utility protocols, and E-Grid values.

4.8.4.3 Construction Impacts and Mitigation Measures

Impact GHG-1: Construction of the project would generate greenhouse gas emissions, either directly or indirectly, that would not have a significant impact on the environment. (Less than Significant)

Construction of the project is anticipated to occur over a 3-year period starting in 2016 with buildout in 2019. Construction activities include site preparation, site grading, operation of construction equipment, stationary power, building construction and related off-site travel, and off-gassing from paving and architectural coatings. Construction related air quality emissions are temporary and end once construction is complete. Operation of mobile equipment is the primary source of greenhouse gas emissions during construction, including off-road emissions from construction equipment and material hauling. Table 4.8-1 summarizes the estimated GHG emissions from all construction activities from 2016 through 2019; emissions were computed on an annual basis. As shown in the table, construction of the project would result in a total of 3,340.44 metric tons of CO_2e emissions totaled over the three-year construction timeframe. This emission level is less than the SCAQMD's annual 10,000 MT operational threshold; therefore, the construction-related GHG emissions impact is considered less than significant and no mitigation is required.

TABLE 4.8-1: CONSTRUCTION GHG EMISSIONS SUMMARY (Metric Tons/Year)

Year	CO_2	CH_4	N_2O	Total CO_2e
2016	765.83	0.11	0.00	768.32
2017	900.11	0.23	0.00	904.99
2018	1,462.39	0.22	0.00	1,467.17
2019	199.37	0.02	0.00	199.95
			Total Construction CO_2e	**3,340.44**
			SQAQMD Threshold (per year)	**10,000**
			Significant Impact?	**No**

Source: CalEEMod Versions 2013.2. See Appendix B for detailed tables. Values shown represent the total unmitigated GHG emission projections for construction of the proposed project.

Impact GHG-2: Construction of the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (Less than Significant)

The Riverside County Climate Action Plan (2015) provides GHG emission reduction policies and regulations specific to construction activities that apply to the proposed project. These

reduction measures include an anti- or limited-idling policy for heavy-duty diesel trucks, including long-haul truck transport.

All components of construction, including equipment, fuels, materials, and management practices, would be subject to current and future Riverside County CAP and SCAQMD rules and regulations related to greenhouse gases. Applicable SCAQMD rules include, but are not limited to, source specific standards that reduce the greenhouse gas content in engines, architectural coatings, paving/asphalt, and limit equipment idling durations. In addition, total project construction GHG emissions over the three-year period would be well below the adopted SCAQMD operational threshold of 10,000 metric tons of CO_2e per year. Therefore, since construction-related GHG emissions are below established SCAQMD thresholds, this GHG impact would be less than significant.

4.8.4.4 Operational Impacts and Mitigation Measures

Impact GHG-3: Operation of the project would generate greenhouse gas emissions, either directly or indirectly. (Less than Significant)

There are five emission source categories that contribute either directly or indirectly to operational GHG emissions, including energy/electricity usage, mobile sources, area emissions, off-road sources, and water pumping. Energy sources refer to direct and indirect use of fossil fuels for energy use, including electricity usage in buildings, lighting for parking structures and ventilation. Mobile sources refer to emissions associated with motor vehicle trips generated by the project, which is limited to employee commute and maintenance/delivery trips. Area sources refer to consumable products such as building maintenance and cleaning supplies, restroom supplies, and periodic reapplication of architectural coatings. Off-road sources refer to motor vehicle trip rates that may occur on un-paved roadways, such as disposal trips to wells sites. Water pumping refers to the GHG emissions associated with supplying and treating water and wastewater to the proposed treatment facilities.

As previously mentioned, CO_2e emissions from electricity demand were calculated based on the total project operational demand and the GHG intensity factors of the electricity utility provider. The following table provides the breakdown electricity demand used for GHG analysis.

TABLE 4.8-2: OPERATIONAL ELECTRICTY DEMAND SUMMARY

Project Facility	Annual Demand	Utility Provider
SBA Well Sites (23 Sites)	3,350,280 kWh	IID
WBA Well Sites (6 Sites)	- 490,494 kWh	IID
ID8 Treatment Facility	7,061,000 kWh	SCE
La Quinta Treatment Facility	5,571,000 kWh	IID
CRRF: Evaporation Ponds	1,893,690 kWh	IID
CRRF: Crystallization	4,389,690 kWh	IID
TOTAL with Evaporation Ponds	**17,385,467 kWh**	**IID/SCE**
TOTAL with Crystallization	**19,881,476 kWh**	**IID/SCE**

Table 4.8-3 shows the projected operational annual emissions of greenhouse gases for the project for both the CRRF evaporation pond process and the brine crystallization process. Separate GHG model runs were prepared for each utility provider (IID and SCE) based on the operational demand assumptions presented in Table 4.8-2, above. The ID8 WBA Water Treatment Facility is the only facility to be modeled using the SCE GHG intensity factor due to its location within the SCE service boundary. Therefore, GHG emissions from the ID8 WBA Water Treatment Facility are provided separately from the remaining project facilities, which were modeled within IID service boundaries. This separation of operational emissions is shown in the table below.

The five emission source categories that contribute either directly or indirectly to operational GHG emissions (energy/electricity usage, area emissions, mobile sources, off-road sources, and wastewater) are shown separately in the table. Per guidance from SCAQMD, construction-period GHG emissions were amortized over a 30-year period and the resulting average annual emissions were added to operational emissions and compared to the significance threshold.

TABLE 4.8-3: OPERATIONAL GHG EMISSIONS SUMMARY (METRIC TONS/YEAR)

	Source	CO_2	CH_4	N_2O	CO_2e
CRRF Evaporation Pond Process	Area	0.002	0.000	0.000	0.002
	Energy	5,952.05	0.135	0.028	5,963.62
	Mobile	60.60	0.002	0.000	60.65
	Off-Road	20.18	0.001	0.000	20.32
	Water	186.90	0.782	0.019	209.30
	IID Operational Emissions Total				6,253.90
	SCE Operational Emissions Total (ID8 Facility)				2,028.64
	Operation plus Amortized Construction GHG Emissions*				8,393.88
	SCAQMD Threshold (per year)				10,000
	Impact?				**No**
CRRF Brine Crystallization Process	**Source**	**CO_2**	**CH_4**	**N_2O**	
	Area	0.002	0.000	0.000	0.002
	Energy	7,391.53	0.168	0.034	7,405.89
	Mobile	60.60	0.002	0.000	60.65
	Off Road	14.63	0.001	0.000	14.73
	Water	186.90	0.782	0.019	209.30
	IID Operational Emissions Total				7,690.57
	SCE Operational Emissions Total (ID8 Facility)				2,028.64
	Operation plus Amortized Construction GHG Emissions*				9,830.55
	SCAQMD Threshold (per year)				10,000
	Impact?				**No**

Source: CalEEMod Version 2013.2.2. See Appendix B for detailed tables. Values shown represent the total unmitigated GHG emission projections for operation of the proposed project.
* The total construction GHG emissions, 3,340.44 metric tons, over 30 years equals 111.34 metric tons per year.

As shown in the table, energy sources (electricity demand) generate the greatest GHG emissions for project operations. Operational GHG emissions are not expected to exceed the SCAQMD GHG threshold under either CRRF process option. As previously discussed, GHG emissions from electricity demand are a function of the project's total electricity consumption and the utility provider's GHG intensity factors. Electricity demands of the project are related to the water treatment processes, which are designed achieve compliance with the State's chromium-6 regulation. The project's operational GHG impact is considered less than significant and does not require mitigation.

Impact GHG-4: Operation of the project would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (Less than Significant)

Despite ongoing litigation, challenging the Riverside County CAP, the CAP remains in full force and effect. More than 90% of operational GHG emissions associated with the proposed project are related to electricity usage for the SBA and WBA water treatment processes. The Riverside County CAP provides GHG emission reduction policies and regulations specific to the operational activities, including energy efficient building design, efficient wastewater systems, and the voluntary provision of renewable energy. However there are currently no plans or policies adopted for the specific purpose of reducing industrial GHG emissions associated with water treatment processes.

Operation of the proposed project would not exceed SCAQMD regulation of operational emissions (10,000 metric tons of CO2e per year). Operation would not significantly increase mobile emissions and therefore would not conflict with the reduction goals of SB 375. In addition, the project will not conflict with the goals of executive order S-3-05 because it is not considered a "large emitter" of GHGs (25,000 MT CO_2e/year) requiring cap-and-trade regulation per CARB's regulatory measure to help achieve statewide GHG reduction goals. The proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing the emissions of GHGs. This impact would be less than significant.

4.8.5 SIGNIFICANCE AFTER MITIGATION

No mitigation program is required.

4.8.6 CUMULATIVE IMPACTS

Unlike other sections within the document, cumulative greenhouse gas impacts were not analyzed using a list-based or growth projection approach. Instead, cumulative impacts were analyzed on a regional scale. Through analysis of the regional and statewide plans for GHG reductions, a summary of projects approach was used. The geographic scope for the analysis of potential cumulative greenhouse gas impacts is the overall Salton Sea Air Basin region in which the facilities are being constructed and operated. However, some percentage of electric power and vehicular emissions GHGs associated with the construction, operations and maintenance of the proposed project facilities may also come from sources outside of the SSAB. Therefore, cumulative greenhouse gas impacts were assessed on a regional scale due to the dispersing nature of these pollutant emissions and aggregate impacts from surrounding

jurisdictions and air management districts. Any new power generation or vehicle trips resulting in emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride), would unavoidably contribute, at some level, to greenhouse gas concentrations in the atmosphere.

Based on the above analysis, the vast majority of GHG emissions associated with the proposed project are from operational electric power consumption. However, GHG emissions would not exceed the 10,000 metric tons per year threshold established by the South Coast Air Quality Management District. Therefore, the project's GHG emissions would not be cumulatively considerable.

4.8.7 REFERENCES

California Air and Resources Board. June 16, 2015. *2015 California GHG Emission Inventory.*

County of Riverside. December 2015. General Plan Amendment No. 960.

County of Riverside. February 2015. *Draft Climate Action Plan, Public Review Draft*.

Intergovernmental Panel on Climate Change. May 2007. *Working Group III Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report, Climate Change 2007: Mitigation of Climate Change*.

South Coast Air Quality Management District. October 2008. SCAQMD Draft Guidance Document – Interim CEQA Greenhouse Gas Significance Thresholds.

U.S. Environmental Protection Agency. 2013. *Climate Change, State of Knowledge*. http://www.epa.gov/climatechange/science/stateofknowledge.html.