Figure III-2. SDG&E EV-HP Subscription Charges

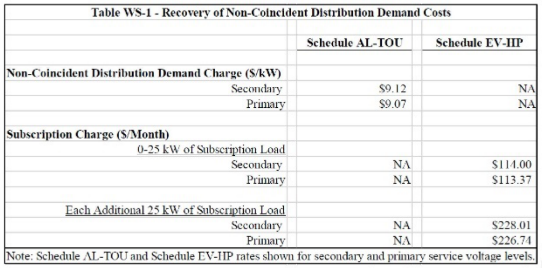

Table WS-1 - Recovery of Non-Coincident Distribution Demand Costs		
	Schedule AL-TOU	Schedule EV-HP
Non-Coincident Distribution Demand Charge ($/kW)		
Secondary	$9.12	NA
Primary	$9.07	NA
Subscription Charge ($/Month)		
0-25 kW of Subscription Load		
Secondary	NA	$114.00
Primary	NA	$113.37
Each Additional 25 kW of Subscription Load		
Secondary	NA	$228.01
Primary	NA	$226.74
Note: Schedule AL-TOU and Schedule EV-HP rates shown for secondary and primary service voltage levels.		

A charging load profile was developed for a 300- and 400-mile per day route and is shown in Figure III-3 to combined with the rate structure to determine a weighted annual electricity rate. The x-axis shows the hour each day where 1 is 1am and 24 is 12am. The y-axis is the percentage of daily charging that occurs within each hour. It allows for the allocation of energy charged to the battery each day to the hour and electricity rate to quantify a weighted annual electricity rate.

Figure III-3. Charging Load Profiles

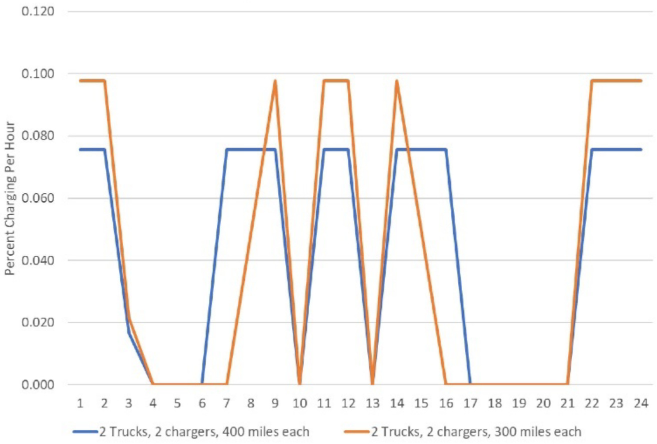

Table 9 shows the weighted electricity rate between SCE and SDG&E if overnight charging occurs in SCE service territory and opportunity charging occurs in SDG&E territory and the time of day from Figure III-3, with electricity consumption at 2.5 kWh/mile.

Table 9 Weighted Electricity Rate

Year	400 Miles/day (1,000 kWh/day)	300 Miles/day (750 kWh/day)
2021	$0.17	$0.17
2022	$0.17	$0.17
2023	$0.17	$0.17
2024	$0.17	$0.18
2025	$0.17	$0.18
2026	$0.18	$0.19

For the 130-mile route, 100% of the charging will occur in San Diego County, all during the overnight hours. Coincidentally, when considering the subscription charges and reduced allocated consumption, the weighted electricity rate is $0.17/kWh.

2.4 Maintenance Costs

ICF relied on data from the AFLEET tool for vehicle maintenance costs.[23] For Class 8 drayage and regional freight trucks, the diesel maintenance costs were $0.20/mile and $0.17/mile for electric trucks. Many electric truck manufacturers project significantly lower maintenance costs in the future (approximately 10 year timeframe) compared to diesel, on the order of a 50% reduction. The current reduction in maintenance costs is inclusive of the higher parts and labor rates for electric with the lower volume of trucks on the roads and optimized maintenance staff.

2.5 Potential Incentives

The three policies and/or potential incentives included in the analysis are the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), utility infrastructure incentives, and the Low Carbon Fuel Standard (LCFS). The HVIP voucher amount for Class 8 trucks is currently $150,000. There is uncertainty about the funding sources, the demand, and the number of vouchers that can be redeemed each year in the HVIP program. Currently there have not been any vouchers redeemed for Class 8 trucks, and each year the HVIP program is oversubscribed. Because of this, the TCO analysis was performed both with and without the HVIP voucher amount. Also, the analysis here does not include the added amount of $15,000 per voucher for trucks based in disadvantaged communities.

The utility infrastructure incentives include those from both SCE and SDG&E that pay for a portion of cost charging infrastructure. The assumption in the analysis is that the utility incentive

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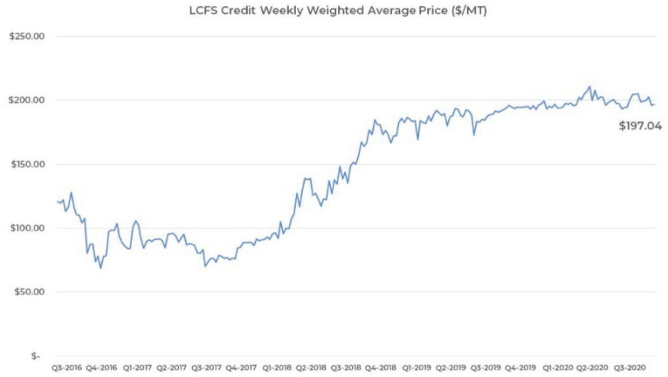
[23] https://greet.es.anl.gov/afleet_tool

will cover 50% of the combined infrastructure and installation cost. The scenario run without the HVIP incentive also did not include the utility incentive.

The LCFS allows electric charging, natural gas, and hydrogen station owners to generate credits from using electricity, renewable natural gas, and hydrogen in their vehicles. EV fleet and station owners are able to retain and monetize 100% of the credits generated when utilizing home base fleet charging. Figure III-4 shows historic LCFS credit prices. The analysis includes a credit price of $150/credit to include the potential risk of a reduction in credit prices and the broker and transaction costs for selling the LCFS credits generated.

Figure III-4. Historic LCFS Credit Prices [24]



2.6 Summary of Inputs

Table 10 shows a summary of the inputs for the TCO analysis.

Table 10 Summary of Inputs

Input Category	Diesel	Electric	Source
Vehicle Cost	$110,000	$350,000 – 2020 $275,000 – 2023	CalETC report; conversations with OEMs
Daily Vehicle Miles Traveled	130, 300, and 400	130, 300, and 400	MCC Primary customer operations
Days per Year	300	300	-

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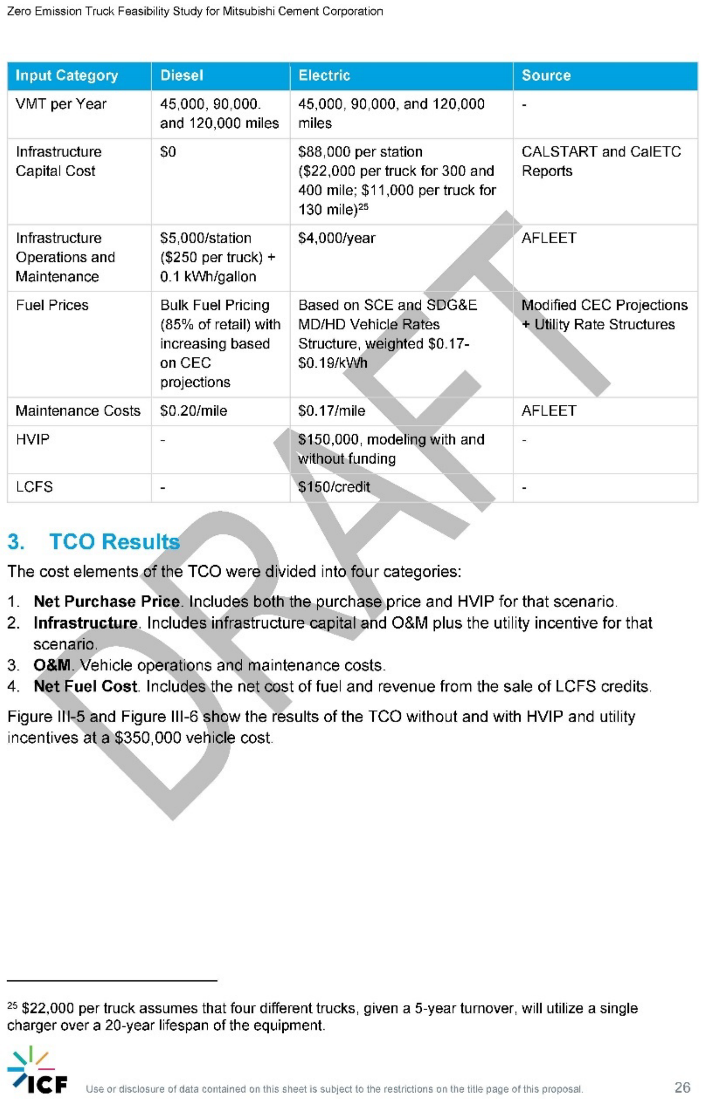
[24] https://srectradeblog.s3.amazonaws.com/August+2020+-+LCFS+Market+Overview_Final.pdf



Input Category	Diesel	Electric	Source
VMT per Year	45,000, 90,000. and 120,000 miles	45,000, 90,000, and 120,000 miles	-
Infrastructure Capital Cost	$0	$88,000 per station ($22,000 per truck for 300 and 400 mile; $11,000 per truck for 130 mile)[25]	CALSTART and CalETC Reports
Infrastructure Operations and Maintenance	$5,000/station ($250 per truck) + 0.1 kWh/gallon	$4,000/year	AFLEET
Fuel Prices	Bulk Fuel Pricing (85% of retail) with increasing based on CEC projections	Based on SCE and SDG&E MD/HD Vehicle Rates Structure, weighted $0.17-$0.19/kWh	Modified CEC Projections + Utility Rate Structures
Maintenance Costs	$0.20/mile	$0.17/mile	AFLEET
HVIP	-	$150,000, modeling with and without funding	-
LCFS	-	$150/credit	-

3. TCO Results

The cost elements of the TCO were divided into four categories:

1. **Net Purchase Price**. Includes both the purchase price and HVIP for that scenario.
2. **Infrastructure**. Includes infrastructure capital and O&M plus the utility incentive for that scenario.
3. **O&M**. Vehicle operations and maintenance costs.
4. **Net Fuel Cost**. Includes the net cost of fuel and revenue from the sale of LCFS credits.

Figure III-5 and Figure III-6 show the results of the TCO without and with HVIP and utility incentives at a $350,000 vehicle cost.

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[25] $22,000 per truck assumes that four different trucks, given a 5-year turnover, will utilize a single charger over a 20-year lifespan of the equipment.

Figure III-5. TCO Results – $350,000 Vehicle Cost with No HVIP or Utility Incentives

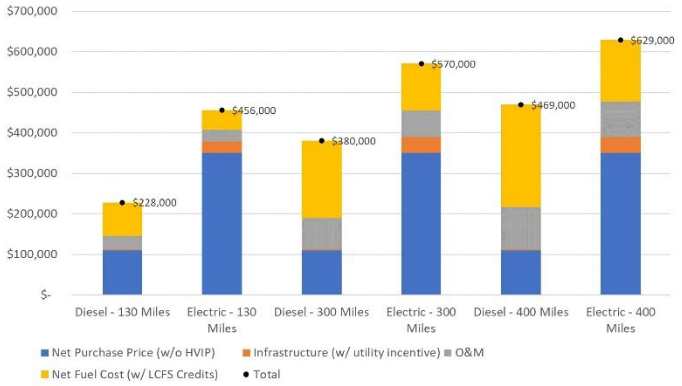
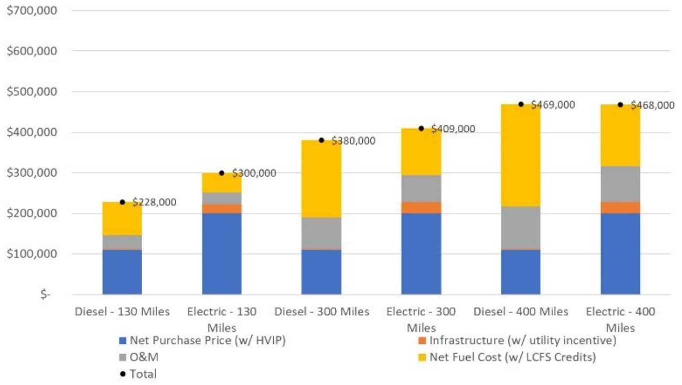


Figure III-6. TCO Results – $350,000 Vehicle Cost with HVIP and Utility Incentives



Without incentives, none of the mileage scenarios are close to having a similar TCO while the 400-mile scenario has the same TCO as diesel when the incentives are included.

Figure III-7. TCO Results – $275,000 Vehicle Cost with No Incentives

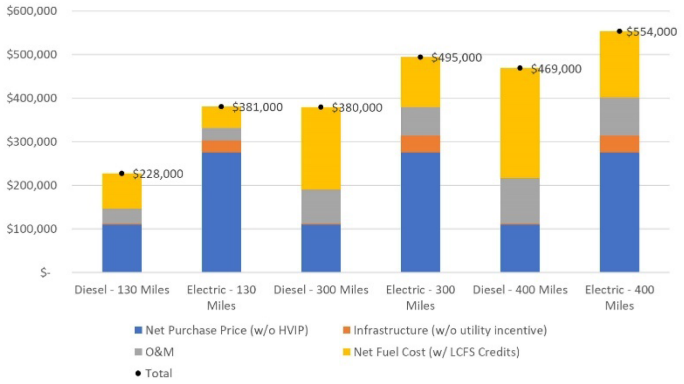


Figure III-8. TCO Results – $275,000 Vehicle Cost with Incentives

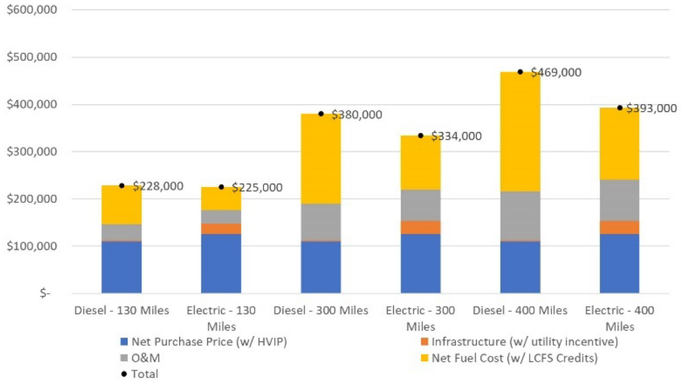


Figure III-7 and Figure III-8 show the results of the TCO without and with HVIP and utility incentives at a $275,000 vehicle cost. Even with a vehicle price reduction of $75,000, without incentives electric trucks do not have a similar TCO in any mileage scenario. When considering incentives, all mileage scenarios have a better TCO than diesel. Depending on available HVIP funding when electric trucks reach an incremental price of $165,000, it is likely the overall voucher amount will be lower than the current $150,000.

The results presented here are for driving the prescribed miles and estimated number of loads per day. The analysis and data in the figures do not represent the 7-14% increase in truck trips required of an electric truck relative to traditional diesel, as shown in Section II.5. Nor does this analysis account for a decrease in efficiency if a truck spends multiple hours per day charging and not in use. When considering the total cost of comparable tons transported, the overall results do not change significantly for the $350,000 vehicle price scenarios. Even with incentives, none of the mileage scenarios show a similar TCO. With a lower electric truck price, without incentives the TCO is not similar in any scenario. When including incentives, only the 300- and 400-mile scenarios have a lower TCO. Appendix I includes the values in Figure III-5, Figure III-6, Figure III-7, and Figure III-8 in addition to the TCO when accounting for 7% incremental trips.

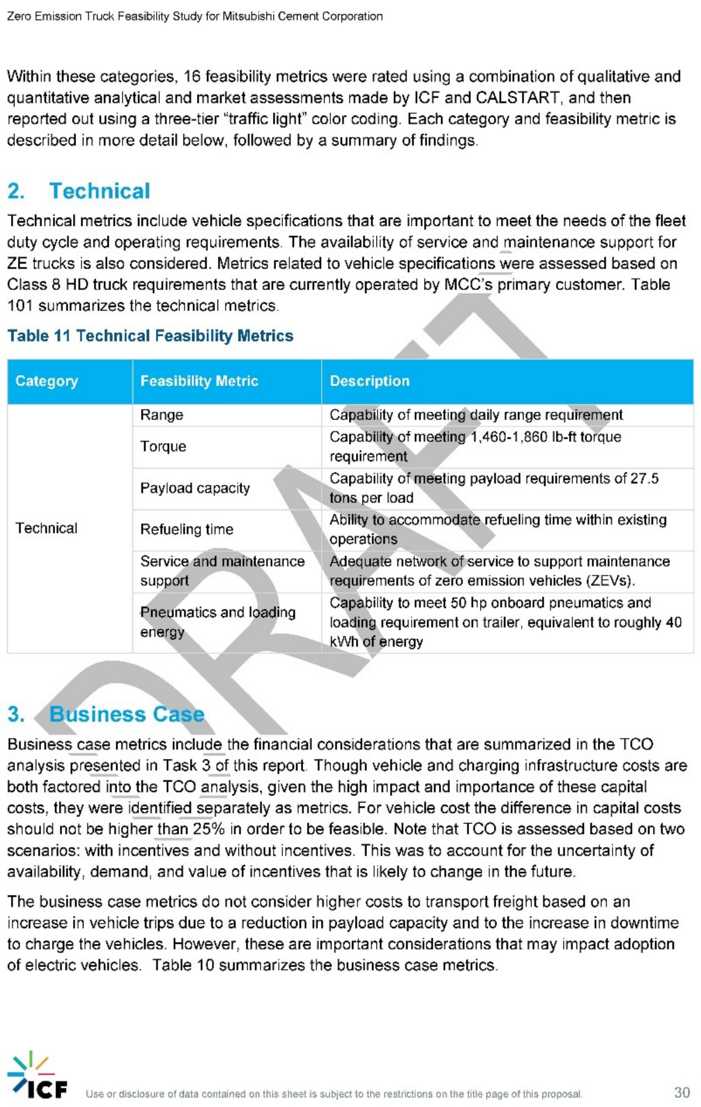
It should be noted that a TCO is an important piece of information when considering the feasibility of implementing alternative technology but is also an incomplete measure. In addition to the cost consideration, the operational considerations need to be taken into account. The load profile in Figure III-3 shows at least three charging events of upwards of an hour or more are needed for the truck to complete the 300 and 400 mile per day operations. These charging events may not be feasible and implementing electric trucks could require infeasible changes to existing operations for trucking companies, especially with the available range of existing and near-term electric trucks. In addition, this TCO is on the truck, not the $/ton delivered, so it does not include driver wages and other dispatch costs that would increase with likely increased downtime during opportunity vehicle charging.

IV. Feasibility Metrics

1. Purpose

The purpose of the Feasibility Assessment is to develop a framework to assess zero emission (ZE) battery-electric Class 8 trucks across different metrics based on MCC's primary customer truck operations, described in Section II. The project team developed a comprehensive set of measures that collectively capture the many criteria important to fleet adoption. The *Feasibility Metrics Scorecard* included metrics grouped into four categories:

- Technical
- Business Case
- Fleet Adoption
- Charging Infrastructure Availability



Within these categories, 16 feasibility metrics were rated using a combination of qualitative and quantitative analytical and market assessments made by ICF and CALSTART, and then reported out using a three-tier “traffic light” color coding. Each category and feasibility metric is described in more detail below, followed by a summary of findings.

2. Technical

Technical metrics include vehicle specifications that are important to meet the needs of the fleet duty cycle and operating requirements. The availability of service and maintenance support for ZE trucks is also considered. Metrics related to vehicle specifications were assessed based on Class 8 HD truck requirements that are currently operated by MCC’s primary customer. Table 101 summarizes the technical metrics.

Table 11 Technical Feasibility Metrics

Category	Feasibility Metric	Description
Technical	Range	Capability of meeting daily range requirement
	Torque	Capability of meeting 1,460-1,860 lb-ft torque requirement
	Payload capacity	Capability of meeting payload requirements of 27.5 tons per load
	Refueling time	Ability to accommodate refueling time within existing operations
	Service and maintenance support	Adequate network of service to support maintenance requirements of zero emission vehicles (ZEVs).
	Pneumatics and loading energy	Capability to meet 50 hp onboard pneumatics and loading requirement on trailer, equivalent to roughly 40 kWh of energy

3. Business Case

Business case metrics include the financial considerations that are summarized in the TCO analysis presented in Task 3 of this report. Though vehicle and charging infrastructure costs are both factored into the TCO analysis, given the high impact and importance of these capital costs, they were identified separately as metrics. For vehicle cost the difference in capital costs should not be higher than 25% in order to be feasible. Note that TCO is assessed based on two scenarios: with incentives and without incentives. This was to account for the uncertainty of availability, demand, and value of incentives that is likely to change in the future.

The business case metrics do not consider higher costs to transport freight based on an increase in vehicle trips due to a reduction in payload capacity and to the increase in downtime to charge the vehicles. However, these are important considerations that may impact adoption of electric vehicles. Table 10 summarizes the business case metrics.

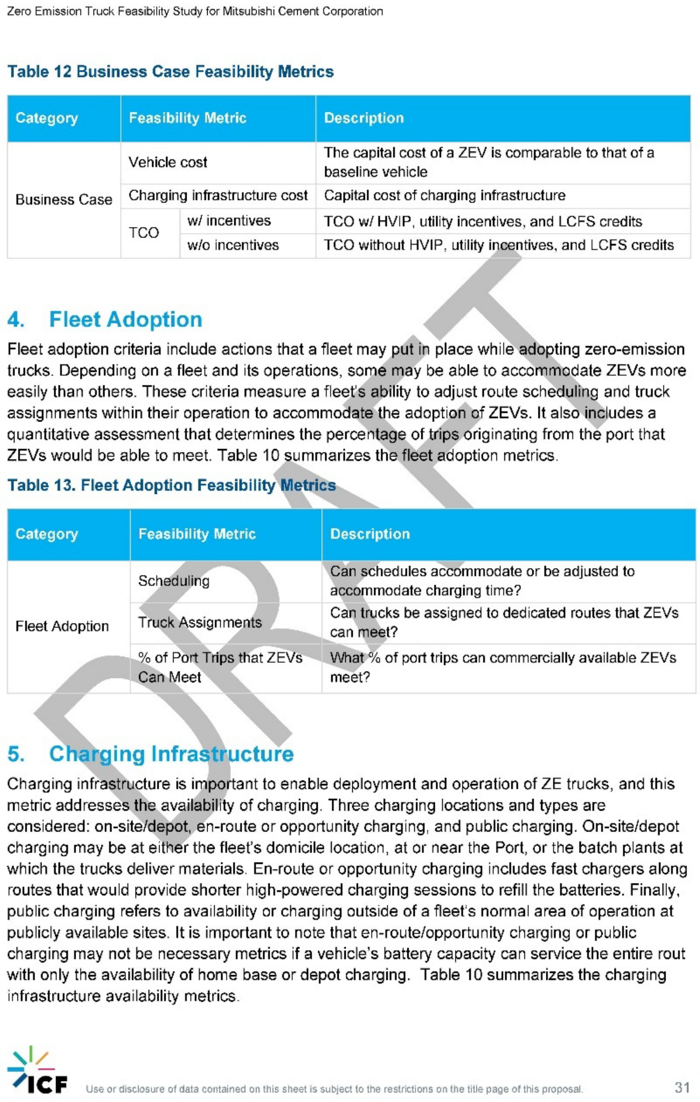


Table 12 Business Case Feasibility Metrics

Category	Feasibility Metric		Description
Business Case	Vehicle cost		The capital cost of a ZEV is comparable to that of a baseline vehicle
	Charging infrastructure cost		Capital cost of charging infrastructure
	TCO	w/ incentives	TCO w/ HVIP, utility incentives, and LCFS credits
		w/o incentives	TCO without HVIP, utility incentives, and LCFS credits

4. Fleet Adoption

Fleet adoption criteria include actions that a fleet may put in place while adopting zero-emission trucks. Depending on a fleet and its operations, some may be able to accommodate ZEVs more easily than others. These criteria measure a fleet's ability to adjust route scheduling and truck assignments within their operation to accommodate the adoption of ZEVs. It also includes a quantitative assessment that determines the percentage of trips originating from the port that ZEVs would be able to meet. Table 10 summarizes the fleet adoption metrics.

Table 13. Fleet Adoption Feasibility Metrics

Category	Feasibility Metric	Description
Fleet Adoption	Scheduling	Can schedules accommodate or be adjusted to accommodate charging time?
	Truck Assignments	Can trucks be assigned to dedicated routes that ZEVs can meet?
	% of Port Trips that ZEVs Can Meet	What % of port trips can commercially available ZEVs meet?

5. Charging Infrastructure

Charging infrastructure is important to enable deployment and operation of ZE trucks, and this metric addresses the availability of charging. Three charging locations and types are considered: on-site/depot, en-route or opportunity charging, and public charging. On-site/depot charging may be at either the fleet's domicile location, at or near the Port, or the batch plants at which the trucks deliver materials. En-route or opportunity charging includes fast chargers along routes that would provide shorter high-powered charging sessions to refill the batteries. Finally, public charging refers to availability or charging outside of a fleet's normal area of operation at publicly available sites. It is important to note that en-route/opportunity charging or public charging may not be necessary metrics if a vehicle's battery capacity can service the entire rout with only the availability of home base or depot charging. Table 10 summarizes the charging infrastructure availability metrics.

Table 14. Charging Infrastructure Feasibility Metrics

Category	Feasibility Metric	Description
Charging Infrastructure Availability	On-site/depot	Availability of on-site/depot charging infrastructure
	En-route/opportunity	Availability of en-route/opportunity charging infrastructure
	Public	Availability of public charging infrastructure

6. Feasibility Metrics Scorecard Results

The *Feasibility Metrics Scorecard* shows the assigned tiers of each of the 16 metrics discussed above. Each metric was evaluated on both quantitative numeric measurements and qualitative assessments of their ability to perform the duties required. They were categorized in a three-tiered “traffic light” methodology: a simple color gradient describing the feasibility of each metric in a few different conditions.

The scorecard legend is shown in Table 10. The scorecard is shown in Table 10.

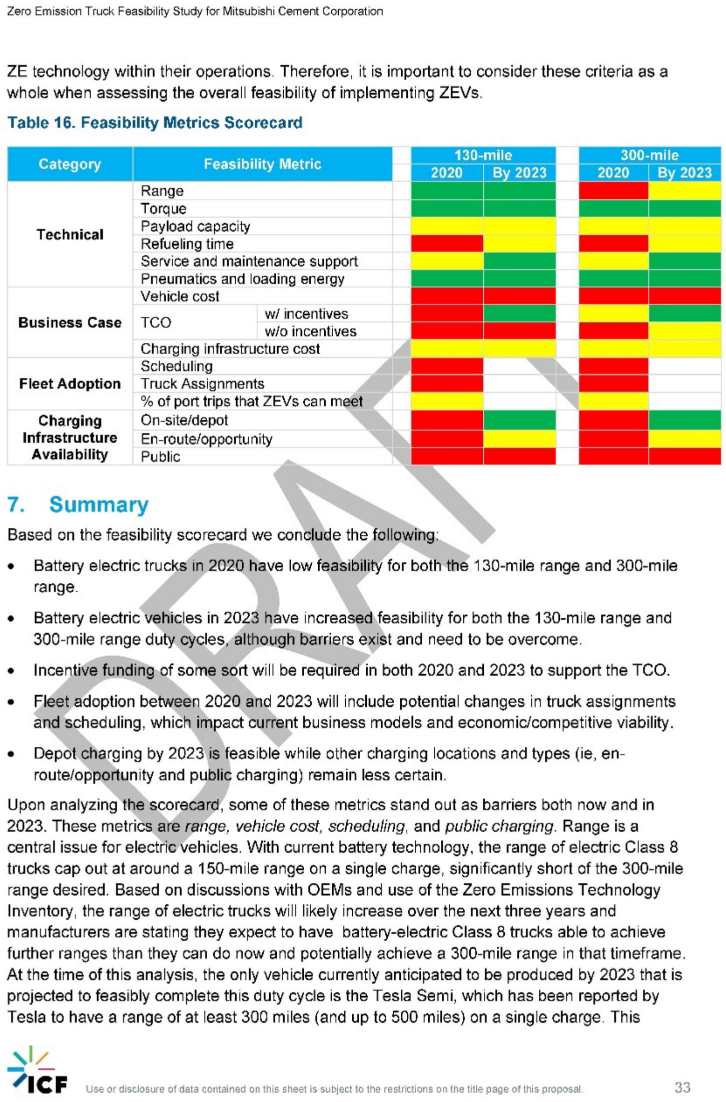
Table 15. Feasibility Metrics Scorecard Legend

🟥	🟨	🟩
Low feasibility	Feasible, but has barriers that need to be addressed	High feasibility

Red denotes metrics that have “low feasibility.” These metrics are difficult to account for and it is unlikely that electric vehicles will meet these metrics. Yellow denotes metrics that are “feasible but have barriers that need to be addressed.” This means that the feasibility is conditional on addressing some hurdles. Green denotes metrics that have “high feasibility” and can be comfortably achieved by ZE trucks. Lastly, some metrics are white, which simply denotes that these metrics do not yet have all the information to be properly evaluated.

Each metric has been analyzed based on feasibility today in 2020 and projected feasibility in 2023, and feasibility is assessed based on two different duty-cycles: 130 miles and 300 miles. When interpreting the results of the *Feasibility Metrics Scorecard*, it is important to note that all metrics need not be showing green for a fleet to move forward with implementation of ZEVs and it will depend on which metrics, combined or in isolation, are or are not green. For example, charging infrastructure does not need to be available on-site, en-route, and publicly to operate ZEVs.

For technical feasibility, it is likely that commercially available ZEVs in 2023 will not be able to meet the full range of duty cycles that a fleet requires, nor would it be recommended for a fleet to transition to all ZEVs without first performing a smaller pilot or demonstration. A phased approach starting with a smaller-scale implementation of ZEVs is an important first step for fleets to take as they look to electrify, bringing valuable information that is important for larger-scale deployments. Implementation of ZEVs will also depend on a fleet’s ability to accommodate



ZE technology within their operations. Therefore, it is important to consider these criteria as a whole when assessing the overall feasibility of implementing ZEVs.

Table 16. Feasibility Metrics Scorecard

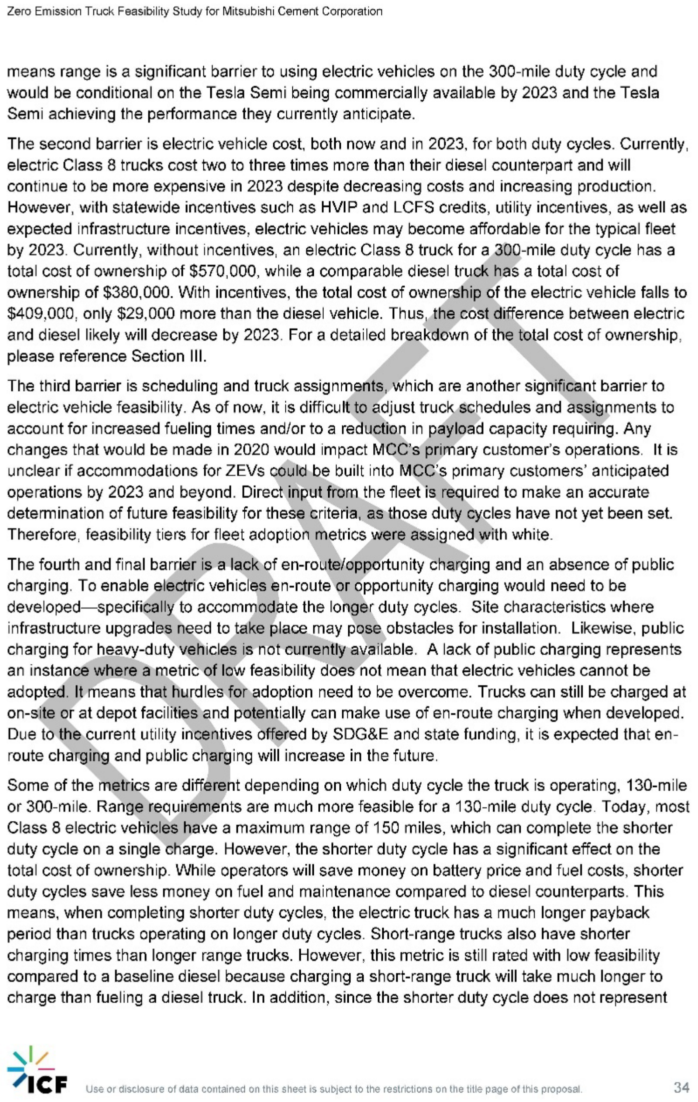
Category	Feasibility Metric		130-mile		300-mile	
			2020	By 2023	2020	By 2023
Technical	Range		🟩	🟩	🟥	🟨
	Torque		🟩	🟩	🟩	🟩
	Payload capacity		🟨	🟨	🟨	🟨
	Refueling time		🟥	🟨	🟥	🟨
	Service and maintenance support		🟨	🟩	🟨	🟩
	Pneumatics and loading energy		🟩	🟩	🟩	🟩
Business Case	Vehicle cost		🟥	🟥	🟥	🟥
	TCO	w/ incentives	🟥	🟩	🟨	🟩
		w/o incentives	🟥	🟥	🟥	🟨
	Charging infrastructure cost		🟨	🟨	🟨	🟨
Fleet Adoption	Scheduling		🟥		🟥	
	Truck Assignments		🟥		🟥	
	% of port trips that ZEVs can meet		🟨		🟨	
Charging Infrastructure Availability	On-site/depot		🟥	🟩	🟥	🟩
	En-route/opportunity		🟥	🟨	🟥	🟨
	Public		🟥	🟥	🟥	🟥

7. Summary

Based on the feasibility scorecard we conclude the following:

- Battery electric trucks in 2020 have low feasibility for both the 130-mile range and 300-mile range.
- Battery electric vehicles in 2023 have increased feasibility for both the 130-mile range and 300-mile range duty cycles, although barriers exist and need to be overcome.
- Incentive funding of some sort will be required in both 2020 and 2023 to support the TCO.
- Fleet adoption between 2020 and 2023 will include potential changes in truck assignments and scheduling, which impact current business models and economic/competitive viability.
- Depot charging by 2023 is feasible while other charging locations and types (ie, en-route/opportunity and public charging) remain less certain.

Upon analyzing the scorecard, some of these metrics stand out as barriers both now and in 2023. These metrics are *range, vehicle cost, scheduling*, and *public charging*. Range is a central issue for electric vehicles. With current battery technology, the range of electric Class 8 trucks cap out at around a 150-mile range on a single charge, significantly short of the 300-mile range desired. Based on discussions with OEMs and use of the Zero Emissions Technology Inventory, the range of electric trucks will likely increase over the next three years and manufacturers are stating they expect to have battery-electric Class 8 trucks able to achieve further ranges than they can do now and potentially achieve a 300-mile range in that timeframe. At the time of this analysis, the only vehicle currently anticipated to be produced by 2023 that is projected to feasibly complete this duty cycle is the Tesla Semi, which has been reported by Tesla to have a range of at least 300 miles (and up to 500 miles) on a single charge. This



means range is a significant barrier to using electric vehicles on the 300-mile duty cycle and would be conditional on the Tesla Semi being commercially available by 2023 and the Tesla Semi achieving the performance they currently anticipate.

The second barrier is electric vehicle cost, both now and in 2023, for both duty cycles. Currently, electric Class 8 trucks cost two to three times more than their diesel counterpart and will continue to be more expensive in 2023 despite decreasing costs and increasing production. However, with statewide incentives such as HVIP and LCFS credits, utility incentives, as well as expected infrastructure incentives, electric vehicles may become affordable for the typical fleet by 2023. Currently, without incentives, an electric Class 8 truck for a 300-mile duty cycle has a total cost of ownership of $570,000, while a comparable diesel truck has a total cost of ownership of $380,000. With incentives, the total cost of ownership of the electric vehicle falls to $409,000, only $29,000 more than the diesel vehicle. Thus, the cost difference between electric and diesel likely will decrease by 2023. For a detailed breakdown of the total cost of ownership, please reference Section III.

The third barrier is scheduling and truck assignments, which are another significant barrier to electric vehicle feasibility. As of now, it is difficult to adjust truck schedules and assignments to account for increased fueling times and/or to a reduction in payload capacity requiring. Any changes that would be made in 2020 would impact MCC's primary customer's operations. It is unclear if accommodations for ZEVs could be built into MCC's primary customers' anticipated operations by 2023 and beyond. Direct input from the fleet is required to make an accurate determination of future feasibility for these criteria, as those duty cycles have not yet been set. Therefore, feasibility tiers for fleet adoption metrics were assigned with white.

The fourth and final barrier is a lack of en-route/opportunity charging and an absence of public charging. To enable electric vehicles en-route or opportunity charging would need to be developed—specifically to accommodate the longer duty cycles. Site characteristics where infrastructure upgrades need to take place may pose obstacles for installation. Likewise, public charging for heavy-duty vehicles is not currently available. A lack of public charging represents an instance where a metric of low feasibility does not mean that electric vehicles cannot be adopted. It means that hurdles for adoption need to be overcome. Trucks can still be charged at on-site or at depot facilities and potentially can make use of en-route charging when developed. Due to the current utility incentives offered by SDG&E and state funding, it is expected that en-route charging and public charging will increase in the future.

Some of the metrics are different depending on which duty cycle the truck is operating, 130-mile or 300-mile. Range requirements are much more feasible for a 130-mile duty cycle. Today, most Class 8 electric vehicles have a maximum range of 150 miles, which can complete the shorter duty cycle on a single charge. However, the shorter duty cycle has a significant effect on the total cost of ownership. While operators will save money on battery price and fuel costs, shorter duty cycles save less money on fuel and maintenance compared to diesel counterparts. This means, when completing shorter duty cycles, the electric truck has a much longer payback period than trucks operating on longer duty cycles. Short-range trucks also have shorter charging times than longer range trucks. However, this metric is still rated with low feasibility compared to a baseline diesel because charging a short-range truck will take much longer to charge than fueling a diesel truck. In addition, since the shorter duty cycle does not represent

the current operating model for the fleets, dedicated truck assignments will be required which may pose an additional economic hurdle for fleets.

As electric vehicle technology is a new and rapidly evolving field, there will be many changes in the upcoming years. In addition to the previously discussed increasing range, a number of metrics will become more feasible in the next 3 years. As service and maintenance technicians are trained and gain more experience, service and maintenance support will likely become more reliable and affordable. Purchase costs of electric vehicles will also decrease over time as production scales up. However, costs are not projected to decrease enough to make the trucks affordable relative to a diesel truck without incentive assistance. Charging time and charging infrastructure cost will also likely decrease, as more powerful chargers are produced and production scales up. Production will likely not have a significant effect on the affordability of chargers but likely will make charging times short enough that charging can be more easily slotted into busy trucking schedules. Lastly, on-site or depot charging has little to no barriers to installation in 2023.

While the focus of this study is on electric trucks, there are other zero-emission options that exist today, most notably hydrogen fuel cell technology. Hydrogen fuel cell vehicles have significant range advantages, comfortably completing the 300-mile duty cycle required by MCC's primary customer. Fueling hydrogen vehicles is analogous to fueling a conventional diesel vehicle and can be done quickly and easily. Unfortunately, because hydrogen vehicles are less commercialized and mass produced than battery electric vehicles (i.e. light-duty vehicles, transit buses), they are more expensive, and the technology is advancing less quickly. Hydrogen trucks currently are in the early demonstration phase. Hydrogen fuel is also quite expensive, costing up to double the amount of diesel. Fueling the trucks is also not an easy task. There are very few options available for public hydrogen fueling, and new hydrogen fueling stations can cost up to $2 million. Regardless, hydrogen fuel cell vehicles remain a zero-emission option for fleets that can demonstrate the ability to deal with these barriers (e.g., cost of the truck and fuel, and lack of fueling infrastructure).

V. Recommendations

1. Purpose

The purpose of this task is to provide recommendations for the Port to consider transitioning to zero emission trucks at the MCC proposed facility. There are four overall recommendations for the Port that start with smaller but tangible results as well as developing an infrastructure plan, surveying and outreach to tenants, and periodic feasibility and regulatory review.

2. Recommendation 1: Vehicle Demonstration

The first recommendation is a vehicle demonstration program at the Port that focuses on MCC and cement/bulk load drivers. The demonstration should allow all drivers of these materials to try out the trucks and experiment with their current operations, including loading at MCC terminal and unloading at batch plants.

This demonstration will allow the trucking companies to evaluate the performance of the new technology and determine the amount and location of charging needed for their operations. They will be able to determine if charging is necessary at batch plants or if all charging can be accommodated at a single location, such as at the Port.

Demonstrations achieve tangible emission reductions and offset conventional (diesel) fueled port trips, the main purpose of which is collecting critical information for successful implementation of zero emission trucks at the Port for each of the different tenants and trucking operations. Demonstrations are a necessary first step to achieving significant and successful implementation of zero emission trucks and will also feed into updates to this feasibility study.

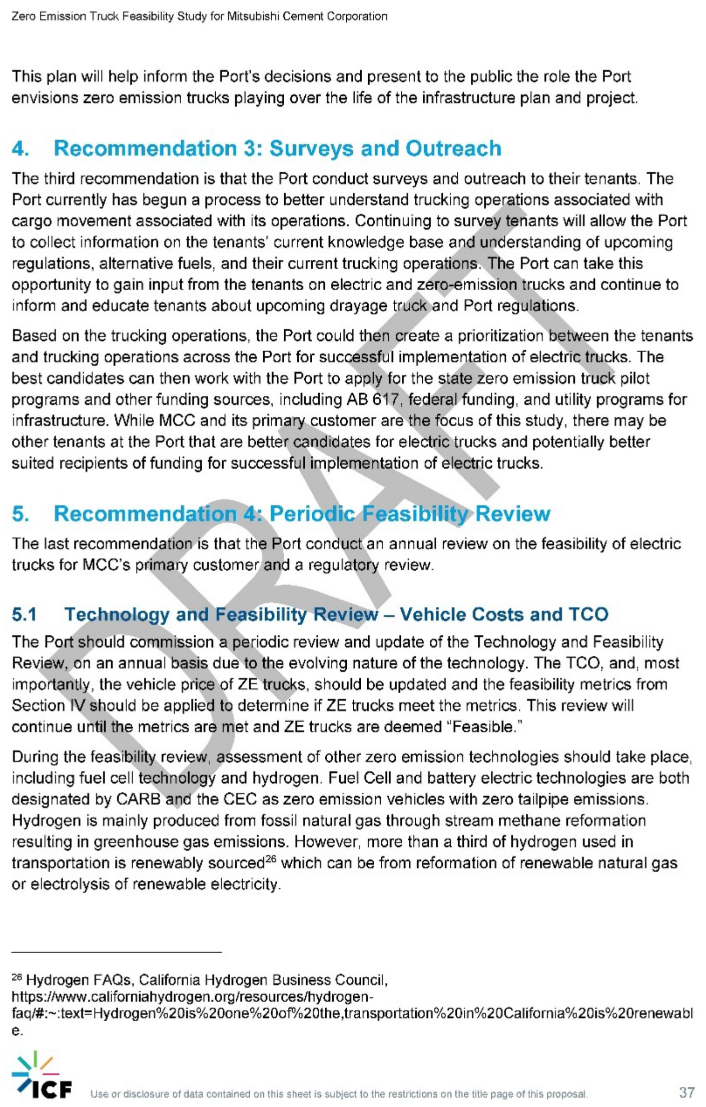
Electric Truck Demonstration

CALSTART has been involved in and tracked the progress of the 8 electric truck demonstrations shown in Table 3. Demonstrations are critical for the long-term success of electric trucks by allowing drivers and operators to gain first-hand experience of benefits, confirm that operational characteristics will suit their current needs, and allow data and information collection for successful full-scale implementation.

3. Recommendation 2: Infrastructure Plan

The next recommendation is that MCC, as well as the Port, in collaboration with its other tenants, develop a zero-emission infrastructure plan that encompasses at least 10 years. The plan will look past the demonstration period and include infrastructure siting, funding and a timeline of future infrastructure at the Port to reach determined and regulatory levels of electric truck adoption. The plans will help answer the following questions:

- Where should charging be located at or near the Port?
- How much infrastructure would be required at or near the Port to achieve regulatory requirements beyond the demonstration and early deployment of zero emission trucks at the MCC facility?
- Can charging infrastructure build-out occur in tandem with existing electrification build-out (i.e., charging for other needs, such as vessel shore power) to reduce or share construction costs?
- What are potential funding mechanisms to implement the infrastructure plan?



This plan will help inform the Port's decisions and present to the public the role the Port envisions zero emission trucks playing over the life of the infrastructure plan and project.

4. Recommendation 3: Surveys and Outreach

The third recommendation is that the Port conduct surveys and outreach to their tenants. The Port currently has begun a process to better understand trucking operations associated with cargo movement associated with its operations. Continuing to survey tenants will allow the Port to collect information on the tenants' current knowledge base and understanding of upcoming regulations, alternative fuels, and their current trucking operations. The Port can take this opportunity to gain input from the tenants on electric and zero-emission trucks and continue to inform and educate tenants about upcoming drayage truck and Port regulations.

Based on the trucking operations, the Port could then create a prioritization between the tenants and trucking operations across the Port for successful implementation of electric trucks. The best candidates can then work with the Port to apply for the state zero emission truck pilot programs and other funding sources, including AB 617, federal funding, and utility programs for infrastructure. While MCC and its primary customer are the focus of this study, there may be other tenants at the Port that are better candidates for electric trucks and potentially better suited recipients of funding for successful implementation of electric trucks.

5. Recommendation 4: Periodic Feasibility Review

The last recommendation is that the Port conduct an annual review on the feasibility of electric trucks for MCC's primary customer and a regulatory review.

5.1 Technology and Feasibility Review – Vehicle Costs and TCO

The Port should commission a periodic review and update of the Technology and Feasibility Review, on an annual basis due to the evolving nature of the technology. The TCO, and, most importantly, the vehicle price of ZE trucks, should be updated and the feasibility metrics from Section IV should be applied to determine if ZE trucks meet the metrics. This review will continue until the metrics are met and ZE trucks are deemed "Feasible."

During the feasibility review, assessment of other zero emission technologies should take place, including fuel cell technology and hydrogen. Fuel Cell and battery electric technologies are both designated by CARB and the CEC as zero emission vehicles with zero tailpipe emissions. Hydrogen is mainly produced from fossil natural gas through stream methane reformation resulting in greenhouse gas emissions. However, more than a third of hydrogen used in transportation is renewably sourced[26] which can be from reformation of renewable natural gas or electrolysis of renewable electricity.

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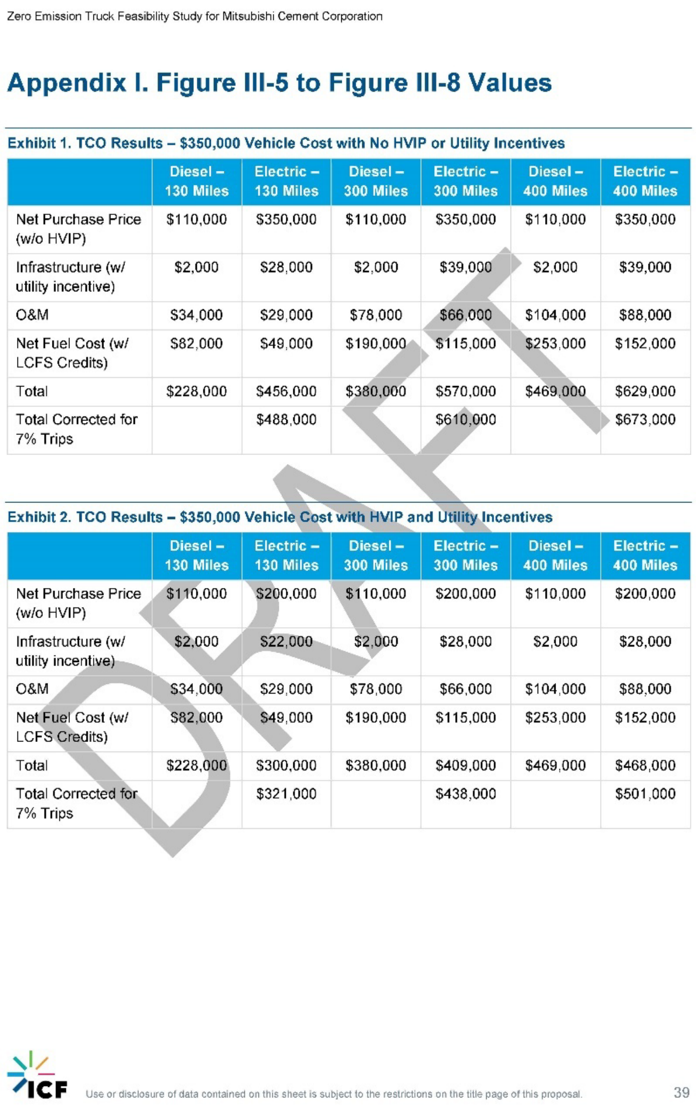
[26] Hydrogen FAQs, California Hydrogen Business Council, https://www.californiahydrogen.org/resources/hydrogen-faq/#:~:text=Hydrogen%20is%20one%20of%20the,transportation%20in%20California%20is%20renewable.

Hydrogen and fuel cell technology could meet the technical and operational requirements of MCC's primary customer. In this first study, hydrogen was not included because it is in an early stage of development and demonstration. Currently there are no hydrogen trucks that are available for even limited purchase or demonstration, with only a few small one or two truck demonstrations occurring. In addition, there is limited and costly infrastructure for hydrogen trucks and high fuel prices. There will need to be significant developments on both the vehicle technology and refueling costs before hydrogen can be seriously considered as an alternative.

5.2 Regulatory Review – Upcoming CARB Regulations

Along with the Technology and Feasibility Review we recommend a Regulatory Review to understand the current state of existing and future regulatory policies that will affect drayage truck and Port truck operations. Along with tracking the "Feasible" determination, the Port may require a transition plan to electric and zero emission trucks that is above and beyond the regulatory requirements. With the lead time necessary for infrastructure and vehicle purchases, the transition plan should take effect within 24 months after the "Feasible" determination. It will be up to the Port and its stakeholders to determine, based on the regulatory landscape, how far above and beyond the regulatory requirements the plan should extend.



Appendix I. Figure III-5 to Figure III-8 Values

Exhibit 1. TCO Results – $350,000 Vehicle Cost with No HVIP or Utility Incentives

	Diesel – 130 Miles	Electric – 130 Miles	Diesel – 300 Miles	Electric – 300 Miles	Diesel – 400 Miles	Electric – 400 Miles
Net Purchase Price (w/o HVIP)	$110,000	$350,000	$110,000	$350,000	$110,000	$350,000
Infrastructure (w/ utility incentive)	$2,000	$28,000	$2,000	$39,000	$2,000	$39,000
O&M	$34,000	$29,000	$78,000	$66,000	$104,000	$88,000
Net Fuel Cost (w/ LCFS Credits)	$82,000	$49,000	$190,000	$115,000	$253,000	$152,000
Total	$228,000	$456,000	$380,000	$570,000	$469,000	$629,000
Total Corrected for 7% Trips		$488,000		$610,000		$673,000

Exhibit 2. TCO Results – $350,000 Vehicle Cost with HVIP and Utility Incentives

	Diesel – 130 Miles	Electric – 130 Miles	Diesel – 300 Miles	Electric – 300 Miles	Diesel – 400 Miles	Electric – 400 Miles
Net Purchase Price (w/o HVIP)	$110,000	$200,000	$110,000	$200,000	$110,000	$200,000
Infrastructure (w/ utility incentive)	$2,000	$22,000	$2,000	$28,000	$2,000	$28,000
O&M	$34,000	$29,000	$78,000	$66,000	$104,000	$88,000
Net Fuel Cost (w/ LCFS Credits)	$82,000	$49,000	$190,000	$115,000	$253,000	$152,000
Total	$228,000	$300,000	$380,000	$409,000	$469,000	$468,000
Total Corrected for 7% Trips		$321,000		$438,000		$501,000

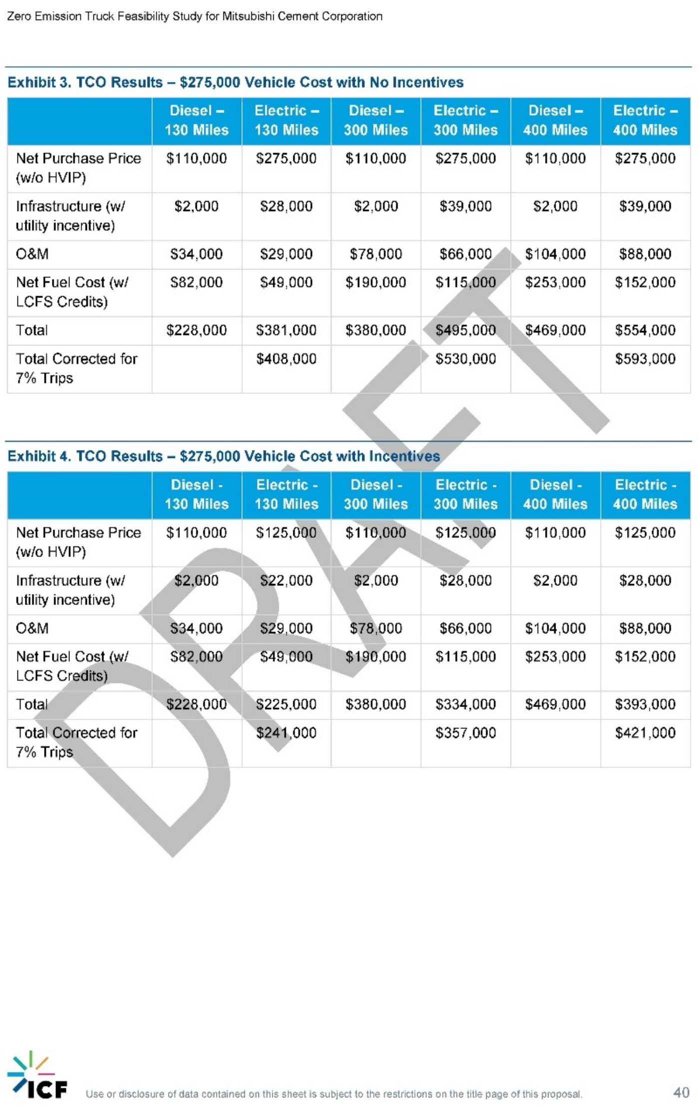
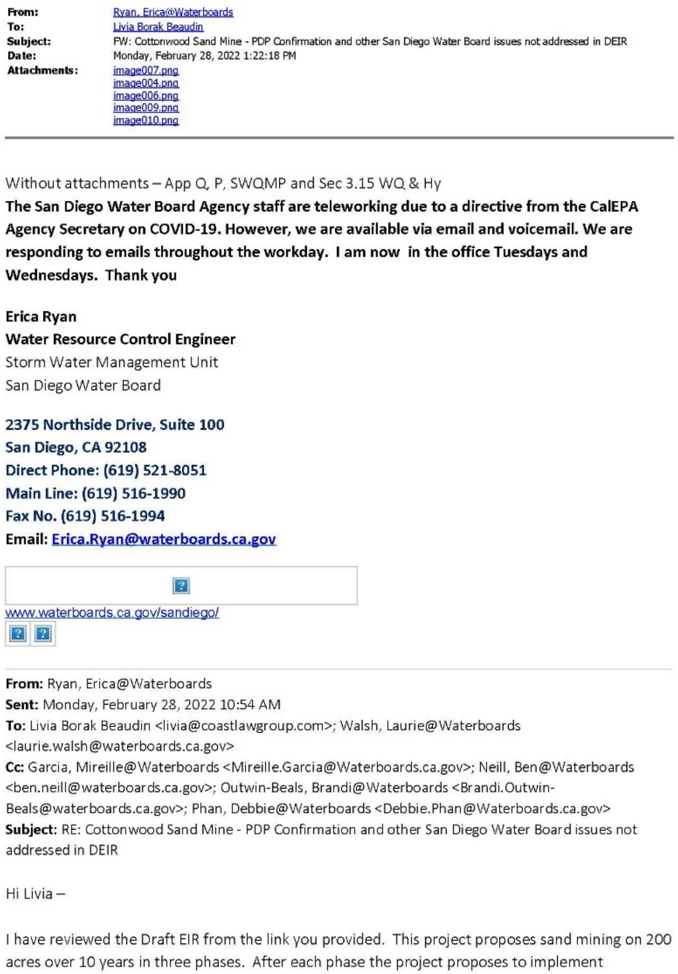


Exhibit 3. TCO Results – $275,000 Vehicle Cost with No Incentives

	Diesel – 130 Miles	Electric – 130 Miles	Diesel – 300 Miles	Electric – 300 Miles	Diesel – 400 Miles	Electric – 400 Miles
Net Purchase Price (w/o HVIP)	$110,000	$275,000	$110,000	$275,000	$110,000	$275,000
Infrastructure (w/ utility incentive)	$2,000	$28,000	$2,000	$39,000	$2,000	$39,000
O&M	$34,000	$29,000	$78,000	$66,000	$104,000	$88,000
Net Fuel Cost (w/ LCFS Credits)	$82,000	$49,000	$190,000	$115,000	$253,000	$152,000
Total	$228,000	$381,000	$380,000	$495,000	$469,000	$554,000
Total Corrected for 7% Trips		$408,000		$530,000		$593,000

Exhibit 4. TCO Results – $275,000 Vehicle Cost with Incentives

	Diesel - 130 Miles	Electric - 130 Miles	Diesel - 300 Miles	Electric - 300 Miles	Diesel - 400 Miles	Electric - 400 Miles
Net Purchase Price (w/o HVIP)	$110,000	$125,000	$110,000	$125,000	$110,000	$125,000
Infrastructure (w/ utility incentive)	$2,000	$22,000	$2,000	$28,000	$2,000	$28,000
O&M	$34,000	$29,000	$78,000	$66,000	$104,000	$88,000
Net Fuel Cost (w/ LCFS Credits)	$82,000	$49,000	$190,000	$115,000	$253,000	$152,000
Total	$228,000	$225,000	$380,000	$334,000	$469,000	$393,000
Total Corrected for 7% Trips		$241,000		$357,000		$421,000



From: Ryan, Erica@Waterboards
To: Livia Borak Beaudin
Subject: FW: Cottonwood Sand Mine - PDP Confirmation and other San Diego Water Board issues not addressed in DEIR
Date: Monday, February 28, 2022 1:22:18 PM
Attachments: image007.png
image004.png
image006.png
image009.png
image010.png

Without attachments – App Q, P, SWQMP and Sec 3.15 WQ & Hy

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Erica Ryan
Water Resource Control Engineer
Storm Water Management Unit
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: (619) 521-8051
Main Line: (619) 516-1990
Fax No. (619) 516-1994
Email: Erica.Ryan@waterboards.ca.gov

www.waterboards.ca.gov/sandiego/

From: Ryan, Erica@Waterboards
Sent: Monday, February 28, 2022 10:54 AM
To: Livia Borak Beaudin <livia@coastlawgroup.com>; Walsh, Laurie@Waterboards <laurie.walsh@waterboards.ca.gov>
Cc: Garcia, Mireille@Waterboards <Mireille.Garcia@Waterboards.ca.gov>; Neill, Ben@Waterboards <ben.neill@waterboards.ca.gov>; Outwin-Beals, Brandi@Waterboards <Brandi.Outwin-Beals@waterboards.ca.gov>; Phan, Debbie@Waterboards <Debbie.Phan@Waterboards.ca.gov>
Subject: RE: Cottonwood Sand Mine - PDP Confirmation and other San Diego Water Board issues not addressed in DEIR

Hi Livia –

I have reviewed the Draft EIR from the link you provided. This project proposes sand mining on 200 acres over 10 years in three phases. After each phase the project proposes to implement reclamation. The project proposes to use groundwater for aggregate process water from 8 wells. In addition, each phase is anticipated to have a 5 acre open area of exposed groundwater during mining operation. The daft EIR relies solely on the IGP to address the proposed impacts from the project and only for road improvements under the Regional MS4 Pe. However, the draft EIR did not include or assess the following issues:

1. Neither sand mining or IGP projects are exempt from provisions E.3.b or E.3.c requirements of the Regional MS4 Permit. Since this project is disturbing over one acre that would generate pollutants, provision E.3.b (1) (f) *(*New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction) is applicable and water quality, hydromodification, including critical course sediment controls, would be required to be implemented. An existing golf course may have high nutrient loads entrained historically in soils that when disturbed can impact downstream receiving waters such as the Sweetwater Reservoir. These issues are not addressed in the draft EIR.
2. The Draft EIR omits and does not assess any impacts to the San Diego Bay WQIP accepted by the San Diego Water Board.
3. Reclamation phases of sand mining projects are not exempt from the CGP. The Draft EIR omits this requirement and does not address impacts from the reclamation phase. The IGP does not cover grading activities for development (ie reclamation).
4. Surface water quality assessments and data used to make conclusions in the Draft EIR do not include monitoring data conducted by Copermittees upstream or downstream under the Regional MS4 Permit or in the San Diego Bay WQIP.
5. The Draft EIR does not assess the potential permit applicability for groundwater discharge to land or extraction from the following San Diego Water Board general permits:
    a. Order R9-2019-005 (https://www.waterboards.ca.gov/sandiego/board_decisions/adopted_orders/2019/R9-2019-0005.pdf) CONDITIONAL WAIVERS OF WASTE DISCHARGE REQUIREMENTS FOR LOW THREAT DISCHARGES IN THE SAN DIEGO REGION (ca.gov) Waiver 3 for low threat discharges to land and Waiver 8 for discharges of slurries to land from sand and gravel mining operations.
    b. Order R9-2015 -0013, GENERAL WASTE DISCHARGE REQUIREMENTS FOR GROUNDWATER EXTRACTION DISCHARGES TO SURFACE WATERS WITHIN THE SAN DIEGO REGION https://www.waterboards.ca.gov/sandiego/board_decisions/adopted_orders/2015/R9-2015-0013.pdf

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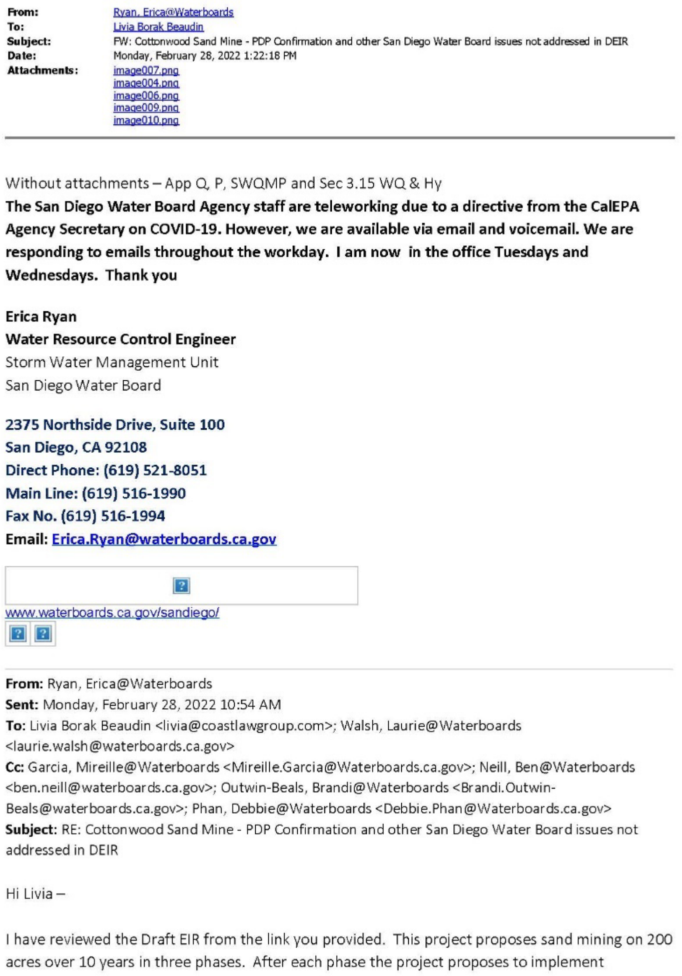

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From: Livia Borak Beaudin <livia@coastlawgroup.com>
Sent: Thursday, February 24, 2022 3:36 PM
To: Walsh, Laurie@Waterboards <Laurie.Walsh@waterboards.ca.gov>; Ryan, Erica@Waterboards <Erica.Ryan@Waterboards.ca.gov>
Subject: MS4 Permit PDPs

EXTERNAL:

Hi Laurie and Erica,

Sorry to bug you both but you're listed as the contacts for the MS4 permit so I hope you can help me with an MS4 Permit question. I'm reviewing the Draft EIR for the proposed Cottonwood Sand Mine project for CERF and San Diego Coastkeeper and see the SWQMP states the sand mine is not subject to the MS4 Permit. (p.2). The sand mine itself is over 200 acres (phased over 10 years) and would be subject to the IGP once operational. I know the project proposes minimal impervious area (mainly associated with the PDP-exempt road), but it seems it would still qualify as a PDP because it results in the disturbance of more than one acre and is expected to generate pollutants post construction. (MS4 Permit, Section E.3.b.(1)(f)).

Am I missing something? Thank you in advance for any help or guidance!
~Livia

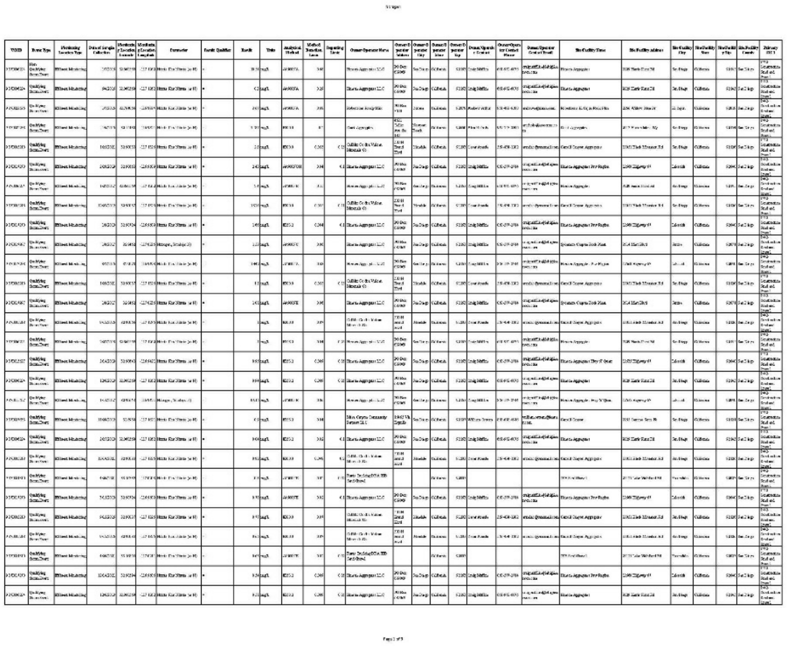
Description: logo

Livia Borak Beaudin (she/her)

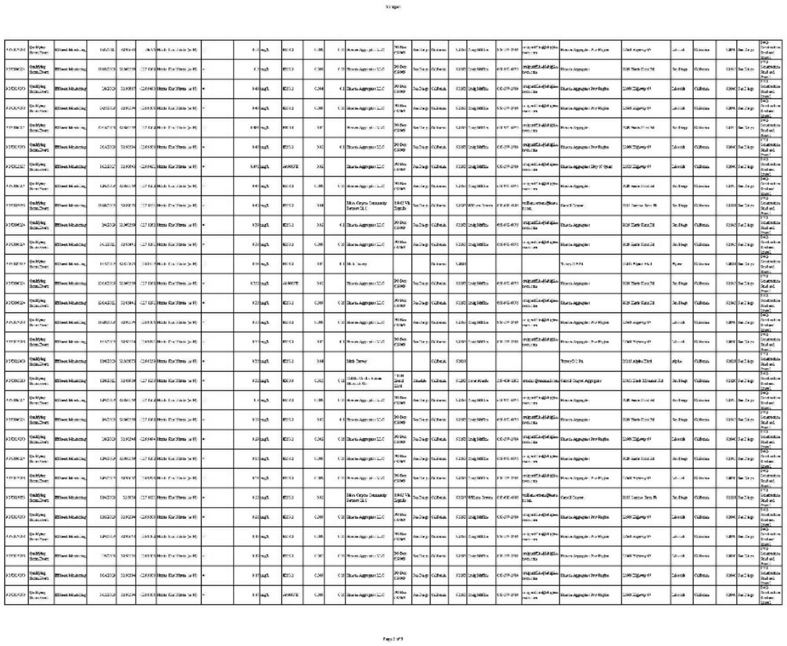
Coast Law Group LLP
1140 South Coast Highway 101
Encinitas, California 92024
tel. 760.942.8505 x118
fax 760.942.8515

"Like music and art, love of nature is a common language that can transcend political or social

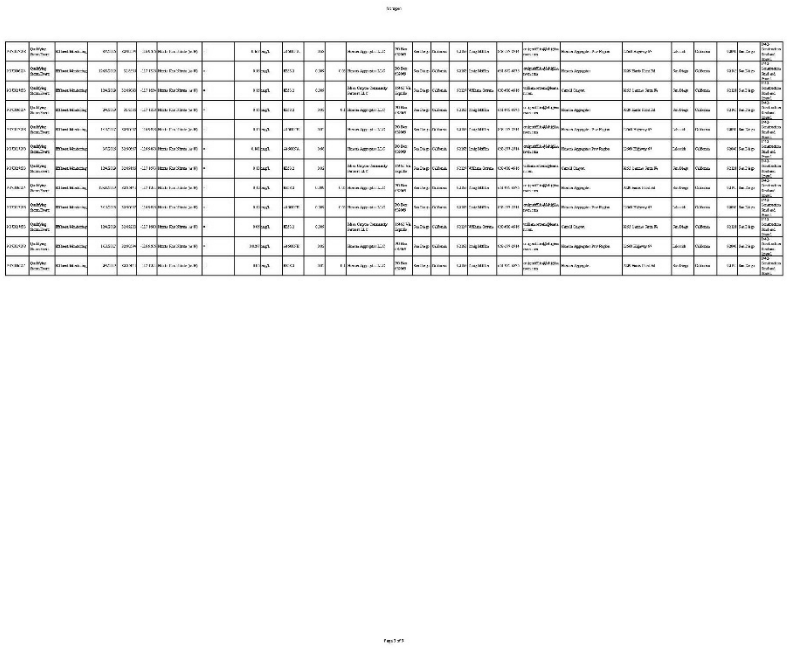
boundaries." – Jimmy Carter



COMMENTS

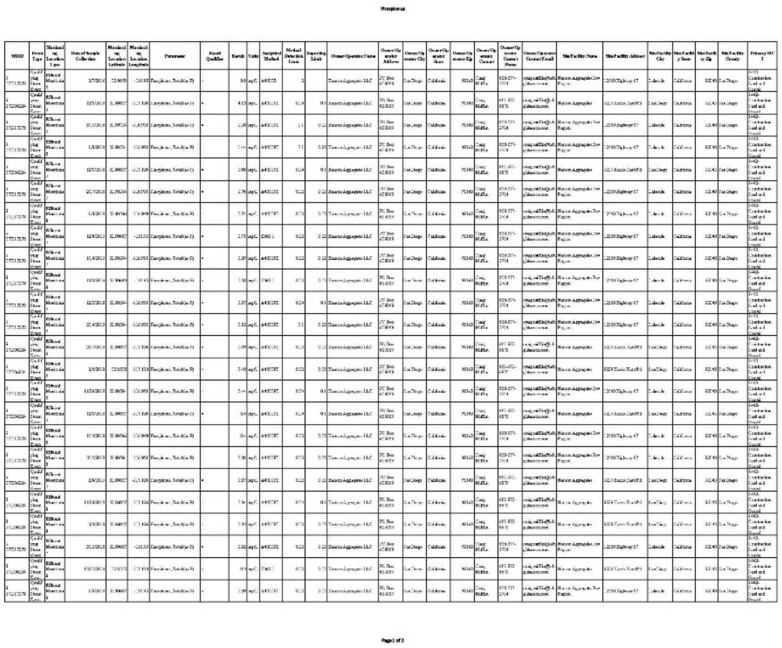


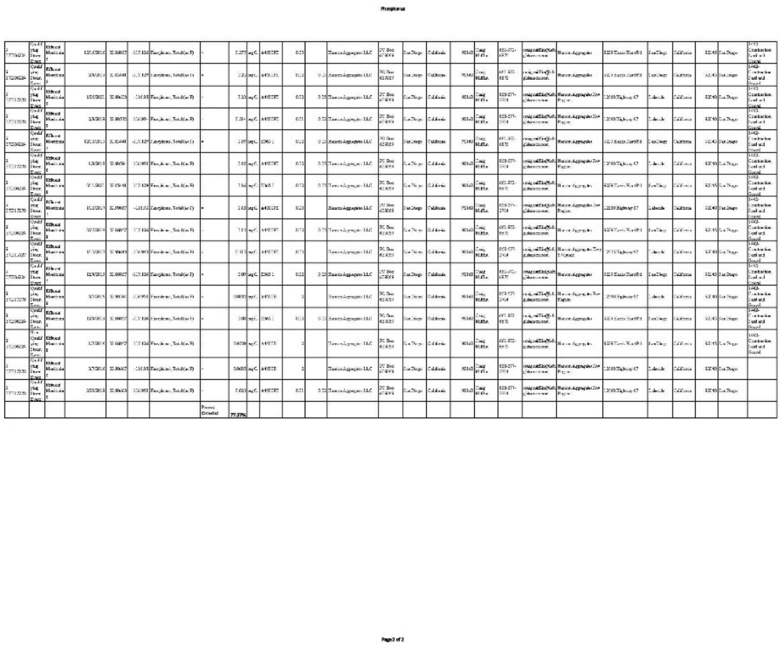
RESPONSES



COMMENTS

RESPONSES





Phosphorus

Page 2 of 2