Project Management Office (PMO)

Special Project Report 2

(SPR2)

Version 1.9

Feb 26, 2025

Document Version History

Version #	Date	Author	Summary of Changes
0.1	04-10-2024	Ben Valsvik	Initial Draft
0.2	06-20-2024	Ben Valsvik, Kalyani Ghare, Nicole Dolney, Rafael Carrasquel	Submission Draft
0.3	07-16-2024	Tejaswi Thalluru	Changed the format of the language on the 3.1, 3.2.3 sections in the form of bullet points.
0.4	07-17-2024	Tejaswi Thalluru	Formatting changes, minor fixes to the sections, Schedule, Deliverables tables are updated to the latest versions.
0.5	07-17-2024	Rafael Carrasquel, Tejaswi Thalluru	Updated the IPOR status with the latest IPOR months' updates, description for the Project Schedule, Project Schedule, Work In Progress, Risk Register/Risks and Issues Log sections and added Glossary section.
0.6	08-02-2024	Tejaswi Thalluru	Updated as per comments from Agency's comments log.
1.0	08-02-2024	Tejaswi Thalluru	Released Version to Agency.
1.1	08-13-2024	Tejaswi Thalluru	Updated as per comments from Agency's comments log.
1.2	08-21-2024	Tejaswi Thalluru	Released Version.
1.3	08-29-2024	Tejaswi Thalluru	Updated as per comments from Agency's comments log.
1.4	09-06-2024	Tejaswi Thalluru	Removed NCB references, old material from early phases of SPR development.
1.5	09-13-2024	Tejaswi Thalluru	Released Version.
1.6	09-18-2024	Tejaswi Thalluru	Updated Introduction paragraph.
1.7	11-21-2024	Tejaswi Thalluru	Updated the document as per the latest CDT Critical Partners feedback.
1.8	12-18-2024	Tejaswi Thalluru	Updated the document as per the latest CDT Critical Partners feedback.
1.9	02-27-2025	Tejaswi Thalluru	Updated the $ amounts as per the updated FAW.

Contents

1. Introduction

During the past year, the project has had a number of successes and challenges. With respect to the successes, the vendor has successfully delivered several key modules, there has been extensive knowledge gained within the project, resulting in an efficient project team, and the project management team has put in place new processes and training to address challenges and lessons learned over the last year (described in more detail in Section 3.1). The challenges encountered, however, resulted in impacts on the project's schedule, costs, scope, and resources, which this SPR will address. In good faith, CARB has communicated the project's approach of using the previously approved SPR/FAW 1 and (updated SPR 1) as the baseline on which to build SPR/FAW 2 in terms of costs and estimated future costs. CARB did so based on its understanding from the Department of Technology that these documents represent the last authorized project approvals.

However, CARB is aware that in earlier project years there was an IV&V vendor and possibly other ancillary contracts procured to support IMPEI. Due to the high turnover of CARB staff, current resources cannot determine the specificities of these contracts. Based on these facts, along with the understanding that SPR 1 and 1A are the baseline for SPR 2, CARB made the decision to continue with the original approach (to use the previously approved SPR/FAW 1 and (updated SPR 1) as the baseline for SPR/FAW 2.

2. Information Technology Project Summary Package

SECTION A: EXECUTIVE SUMMARY

1. **Submittal Date**
   07/26/2024

2. **Type of Document**
   ☒ **SPR** ☐ **PSP ONLY** ☐ **Other:** Enter a description if you selected Other

   Project Number: 3900-069

3. **Project Title**
   Integrated Multi-Pollutants Emissions Inventory

   Project Acronym

   IMPEI

   Estimated Project Dates

   Start: 12/31/2020 End: 10/27/2025

4. **Submitting Agency/state entity**
   California Air Resources Board

5. **Reporting Agency/state entity**
   California Environmental Protection Agency

6. **Project Objectives**
   The current legacy CARB emission inventory is made up of decades-old disparate systems that cannot adequately satisfy the current and emerging needs of CARB and its stakeholders, especially those required by Assembly Bills 617 and 197. These bills call for improved and consistent emission data reporting, improved granularity to better assess community-level impacts of air pollution, and improved public accessibility of emission data covering all regions and pollutant types. A replacement system must satisfy the high-level objectives outlined in the Stage 1 Business Analysis, namely: 1) improve efficiency in managing and accessing emission inventory data, 2) provide secure and user-friendly tools for reporting and updating emissions data in the inventory system, and 3) satisfy the modern needs of CARB and its stakeholders which include detailed community-level data and integrated multi-pollutant analyses.

7. **Proposed Solutions**
   The California Air Resources Board, Air Quality Planning and Science Division, proposes a replacement emission database system with a modern, secure, and user-friendly interface which satisfies historic and ongoing program needs, including recent AB 617 and AB 197 requirements for improved access and community-level focus, and integrates all air pollutants inventoried by CARB: greenhouse gases, criteria pollutants, and toxic air contaminants.

8. Major Milestones	Estimated Completion Date
Project Initiation	06/29/18
Phase 1 Solution Design	01/18/23
Phase 2 Solution Framework	07/17/23
Phase 3 Core Development	09/19/24
Partial Phase 4	10/10/24
Data Migration	10/14/24
Go Live	10/17/24
Knowledge Transfer	10/29/24
M&O	10/27/25
Stabilization	11/17/24
CEIDARS Retires	10/09/26

PIER

Key Deliverables	Estimated Completion Date
PIER	10/14/25

SECTION B: PROJECT CONTACTS

Project #	3900-069
Doc Type	SPR2

Executive Contacts

	First Name	Last Name	Area Code	Phone #	Ext.	Area Code	Fax #	E-mail
Agency Secretary	Yana	Garcia						SectyGarcia@calepa.ca.gov
State Entity Director	Steven	Cliff	279	208-7189				Steven.Cliff@arb.ca.gov
Budget Officer	Irene	Leung	279	208-7456				irene.leung@arb.ca.gov
CIO (Interim)	Gareth	Bevan	916	318-6236				gareth.bevan@arb.ca.gov
Project Sponsor	Vernon	Hughes	916	764-5932				Vernon.Hughes@arb.ca.gov

Direct Contacts

	First Name	Last Name	Area Code	Phone #	Ext.	Area Code	Fax #	E-mail
Document prepared by	Tejaswi	Thalluru	916	324-0656				Tejaswi.Thalluru@arb.ca.gov
Primary contact	Nicole	Dolney	279	208-7344				Nicole.Dolney@arb.ca.gov
Project Manager	Kalyani	Ghare	925	394-6566				Kalyani.ghare@arb.ca.gov
Project Director	Carlotta	Range-Lewis	279	216-0875				Carlotta.range-lewis@arb.ca.gov

SECTION C: PROJECT RELEVANCE TO STATE AND/OR DEPARTMENTAL PLANS

Project #	3900-069
Doc Type	SPR2

1. **What is the date of your current Technology Recovery Plan (TRP)?** **Date** 08/2022

2. **What is the date of your current Agency Information Management Strategy (AIMS)?** **Date** N/A

3. **For the proposed project, provide the page reference in your current AIMS and/or strategic business plan.** **Doc.** **Community Action Plan Blue Print** **Page #** 12

4. **Is the project reportable to control agencies?** ☒ **Yes** ☐ **No**

If YES, CHECK all that apply:

☒	**a) The project involves a budget action.**
☒	**b) A new system development or acquisition that is specifically required by legislative mandate or is subject to special legislative review as specified in budget control language or other legislation.**
☒	**c) The estimated total development and acquisition costs exceed the Department of Technology's established Agency/state entity delegated cost threshold and the project does not meet the criteria of a desktop and mobile computing commodity expenditure (see SAM 4989 – 4989.3).**
☐	**d) The project meets a condition previously imposed by the Department of Technology.**

SECTION D: BUDGET INFORMATION

Project #	3900-069
Doc Type	**SPR2**

Budget Augmentation Required? ☐ No ☒ Yes

If yes, indicate fiscal year(s) and associated amount:

FY		**FY**		**FY**		**FY**	**2024-2025**	**FY**	**2025-2026**
$		**$**		**$**		**$70,400.00**		**$105,600.00**	

Project Costs

1.	Fiscal Year	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24-25	TOTAL
2.	One-Time Cost	$810,790	$1,821,483	$116,959	$902,567	$853,611	$3,405,980	$2,051,771	$435,903	$10,399,064
3.	Continuing Costs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$406,922	$406,922
4.	TOTAL PROJECT BUDGET	$810,790	$1,821,483	$116,959	$902,567	$853,611	$3,405,980	$2,269,422	$510,339	$10,691,151

Project Financial Benefits

7.	Fiscal Year	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24-25	TOTAL
8.	Cost Savings/Avoidances	N/A	$1,789,898	$85,373	$870,981	$822,026	$3,374,394	$2,237,837	$478,753	$9,659,263
9.	Revenue Increase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

SECTION E: VENDOR PROJECT BUDGET

Project #	3900-069
Doc Type	SPR2

Vendor Cost for SPR Development (if applicable)	**$**0
Vendor Name	QualApps, Inc.

Vendor Project Budget

1.	Fiscal Year	17-18	18-19	19-20	20-21	21-22	22-23	23-24	24-25	TOTAL
2.	**Primary Vendor Budget (includes previous Vendor budget from 18-19)**	N/A	$421,038.00	N/A	N/A	N/A	$1,608,000.00	$792,000.00	N/A	**$2,821,038.00**
3.	**Independent Oversight Budget (includes STP budget for 21-22, 23-24)**	$54,000.00	$112,560.00	$56,280.00	$56,280.00	$72,947.00	$112,560.00	$54,459.00	$54,000.00	**$573,086.00**
4.	**IV&V Budget***	N/A	N/A	N/A	N/A	N/A	$55,680.00	$229,545.00	$7,785.00	**$2,93,010.00**
5.	**Other Budget (Project Manager and Business Analyst)**	N/A	$105,120.00	N/A	$ 230,120.00	$ 230,120.00	$154,180.00	$534,481.00	$193,851.00	**$1,447,872.00**
6.	**TOTAL VENDOR BUDGET**	$54,000.00	$638,718.00	$56,280.00	$286,400.00	$303,067.00	$1,930,420.00	$1,610,485.00	$255,636.00	**$5,135,006.00**

***Note:** Although IV&V solicitation was released, the IV&V Vendor was not assigned to IMPEI Project prior to the Primary Vendor termination in 2019. As historical information is unavailable to the current Project and Contract teams, here are no expenditures to report under IV&V for the 2017 – 2022 Fiscal Years on the IMPEI project.

Previous Vendor History Specific to this Project

7.	**Primary Vendor**	Eastern Research Group, Inc
8.	**Contract Start Date**	06/25/2018
9.	**Contract End Date (projected)**	06/28/2019
10.	**Amount**	$421,038.00

Primary Vendor Contacts

	Vendor	First Name	Last Name	Area Code	Phone #	Ext.	Area Code	Fax #	E-mail
11.	Eastern Research Group, Inc	Linda	Diamond	781	674-7330				Linda.diamond@erg.com

Primary Vendor History Specific to this Project

12.	**Primary Vendor**	QualApps, Inc.
13.	**Contract Start Date**	05/18/2022

14.	**Contract End Date (projected)**	11/17/2024
15.	**Amount**	$2,400,000

Primary Vendor Contacts

	Vendor	First Name	Last Name	Area Code	Phone #	Ext.	Area Code	Fax #	E-mail
16.	QualApps, Inc.	Randy	Doyle	916	600-9382				Randy.Doyle@arb.ca.gov
17.	QualApps, Inc.	Alok	Kumar	916	600-9382				Alok.Kumar@arb.ca.gov
18.	QualApps, Inc.	Eric	Steen	916	761-2899				Eric.Steen@qualapps.com

SECTION F: RISK ASSESSMENT INFORMATION

Project # 3900-069
Doc Type SPR2

RISK ASSESSMENT

Has a Risk Management Plan been developed for this project?

☒ **Yes** ☐ **No**

General Comment(s)
Risks and issues management is the process for managing event and activities that can impact a project's ability to meet timeline, scope, budget, or quality goals. A risk is any unplanned or uncontrolled event or activity that may have an impact on project success toward goals. Issues management is the process for responding to events and activities that are impacting the project's ability to meet timeline, scope, budget, or quality goals. An issue is any unplanned or uncontrolled event or activity that has occurred and is impacting a project's success toward goals. This Risk and Issue Management Plan (Refer to Appendix A for the Plan) is comprised of two subplans: • Risk Management Plan • Issue Management Plan These plans will detail how risks and issues will be introduced, analyzed, assigned, managed and controlled.

3. Proposed Project Change

3.1 Project Background Summary

This SPR is the result of a number of factors impacting the project after the approval of the last SPR1 Update. The most significant drivers include gaps in training, staff shortages and attrition, lack of knowledge transfer due to core team members moving or retiring, and findings after the initial release (R1) User Acceptance Testing (UAT) activities were performed. These challenges resulted in impacts on the project's contract schedule, cost, and resources. As a result of these lessons learned (described in more detail in Section 3.3), CARB is implementing the following project changes to ensure the successful completion of the IMPEI project:

Project Refinements

- **Objective:** The project team identified the need to update the current business rules as a result of the findings after R1 UAT and changes to US EPA's proposed reporting rules (under the Air Emissions Reporting Regulation (AERR) and the National Emissions Inventory (NEI)), and testing, review of deliverables (details are provided in Section 3.4) to meet the business needs.
- **Implementation Mechanism:** Through this SPR2, CARB is outlining the changes needed to the business rules and how these changes will be achieved. Specifically, CARB will complete the following:
    - Release 1 (data collection)
    - Release 2 (data augmentation)
    - Release 3 (forecasting)
- Partial Phase 4, which includes the data framework only for Phase 4, thus becoming the Minimum Viable Product (MVP). All project Objectives shall be met with the Minimum Viable Product (MVP). MVP covers the more complex creation of the data frameworks and tables while M&O will cover the simpler web publication of the data. The vendor will be responsible for delivering the more complex creation of the data frameworks and tables and placing that data in the IMPEI publication schema. The data will be published in maintenance and operations (M&O) and the data frameworks for IMPEI very closely match those in the legacy system which CARB has had more than 30 years of experience building, maintaining and connecting to the existing web tools.

Project Schedule

- **Objective:** CARB is planning to complete the MVP by the end of the current contract end date (November 17, 2024).
- **Implementation Mechanism:** Through this SPR2, CARB is outlining the project schedule needed to develop and deploy the MVP successfully.

Project Cost

- **Objective:** Authorize CARB to utilize its own funding to account for ongoing and future expenses, covering the cost of contractors and State staff through the completion of the project, which is scheduled for November 2024. The vendor will receive no additional funds. CARB's Procurement and Contracting team plans to address the funding related information with the Vendor team.
- **Implementation Mechanism:** Through this SPR2, CARB is outlining the project costs needed to develop and deploy the MVP successfully.

CARB has already addressed the gaps for staffing shortages and knowledge gaps by performing the following actions:

- Bringing on sufficient staff resources
- Establishing a stable team with expertise and knowledge in various project areas to minimize further attrition
- Cross-training staff
- Re-reviewing requirements
- Considering the findings (need to update the current business rules) after R1 UAT

3.2 Project Status

The Project's Overall Health was Red as reported by CDT from the Independent Project Oversight Report submitted on for October 2024 reporting period.

Since the project started, we have seen notable successes in major functionality and technology, including the completion of the Data Collection and Augmentation Modules, which were completed as of June 2024.

The following components are noted, as well as their stages of development.

1. **Data Collection Module (Release 1)** – Development and User Acceptance Test (UAT) completed.
2. **Data Augmentation Module (Release 2)** – Development and User Acceptance Test (UAT) completed.
3. **Forecasting (Release 3)** - Development is complete, and the business team began reviewing system testing, User Acceptance Test (UAT) is in progress.
4. **Cross Module Reports and Cross Module Search (Phase 4) -** Development is complete.

3.2.1 Project Phases and Milestones Completed / In Process

The project milestones are listed on the Project Schedule with the latest statistics as of this SPR's submission date, the schedule document is below (.mpp and PDF versions are listed):


OIS_IMPEI_Project_
Master_Schedule_09

OIS_IMPEI_Project_
Master_Schedule_09

3.2.2 Project Expenditures to Date

Reported expenditures to date as of this SPR's submission (09-13-2024) total $9,994,773.

3.2.3 Benefits Achieved

The Integrated Multi-Pollutant Emission Inventory (IMPEI) tool offers a range of benefits that significantly enhance the emissions data reporting process. With its modernized, secure, and user-friendly portal, IMPEI streamlines the submission and management of emissions data. The tool's improved quality assurance capabilities ensure the accuracy and consistency of reported data through the development of a staging area. This staging area allows California's air districts to submit emissions data to a live environment where it undergoes rigorous business rules and QA/QC checks. The interactive nature of

these checks enables users to easily assess whether their data submission meets the required quality standards.

The **staging area** in IMPEI serves as a critical component in maintaining data integrity and efficient management. The Staging area also provides:

- A temporary holding space for submitted data, allowing for comprehensive quality assurance.
- Control tests to identify and rectify any errors or inconsistencies.
- Functions as a communication hub, facilitating secure collaboration between liaisons, districts, and facilities.
- Users can stay informed through announcements within the staging area and have the option to enable email notifications for timely updates.
- Submitters actively review and edit their data, addressing any flagged issues directly within the platform.

This collaborative approach enhances data quality and streamlines the workflow. Once the data receives approval from CARB staff, it seamlessly transitions from the staging area to the live database, becoming a permanent part of the emission inventory system.

In addition to the benefits during the data submission process, IMPEI streamlines post-processing efforts after data submittal as below:

- The tool simplifies and expedites the creation of essential inventories such as California's Criteria and Toxics Inventories, the National Emission Inventory, and the State Implementation Plan Inventories.
- By automating and optimizing these post-processing tasks, IMPEI saves valuable time and resources, enabling more efficient and accurate generation of these critical inventories.

This streamlined approach not only improves the overall efficiency of the emission inventory management process but also ensures that the resulting inventories are of the highest quality and consistency.

The project's achievements so far have been listed in Section 3.2 (main) of this document.

3.2.4 Work in Progress

The project team is currently working on the following:

- Release 2 (R2) deliverables review
- Release 3 (R3)
    - R3 UAT
    - R3 deliverables review
- Phase 4 development and system testing review activities

The details of the deliverables with their percentage complete is listed on the Project Schedule linked in Section 4.5.5.

3.3 Reasons for Proposed Project Changes

The reasons for proposed changes include staff attrition, knowledge gaps faced by the Project team, and regulation changes. The most significant factors behind the proposed changes in this SPR are knowledge gaps related to lack of training, staff shortages, and attrition, lack of knowledge transfer during the project when a number of staff retired or moved, proposed changes by US EPA to California's reporting

requirements to the Federal Government[1,2] and lessons learned from the ongoing implementation of the CTR, which had its first year of enhanced reporting requirements in 2023.

Attrition and Knowledge Gaps

The Project team has experienced a higher-than-usual level of attrition since the Project started within the IT and business teams. This attrition, combined with a bare minimum staffing level, affected knowledge gaps and continuity in OIS's Project Management Office (PMO Branch Chief and Supervisors, as well as contracted Project Managers (PMs) and Business Analysts- (BAs)), on the business team side, spanning AQPSD division management (Assistant Division Chief and Project Owner Branch Chief), and the two regulatory sections responsible for implementing CTR and EICG (three supervisors overseeing these sections, the lead Staff Air Pollution Specialist for IMPEI, and the lead Staff Air Pollution Specialist for CTR). On the business side, the necessary scale of business team staff commitment and the required level of knowledge was not fully realized from the start of the project. This resulted in a significant level of competing priorities between the Project and the staff's typical program responsibilities. There were both large knowledge gaps and steep learning curves, often with very short-term notification, associated with implementing IMPEI. These factors, coupled with staff shortages and loss of program continuity, impacted the quality of business rules, user stories, and acceptance criteria developed for each requirement. The lack of training in key areas impacted how well the initial business rules and requirements (functional and non-functional) were written on both the IT and business sides.

These challenges impacted the project's schedule, cost, and resources. Using experience and lessons learned to date, CARB has been able to bring in more resources to address shortfalls in staffing and knowledge and implement training and cross-training. Specifically,

- Between April 2023 and September 2023, CARB added nine (9) new resources to the Project team (the resources were added to perform User Acceptance Testing (UAT) to help meet UAT needs and meet the timeline commitments. The resources are listed on the UAT schedule which is included as part of the Project Schedule in Section 4.5.5 of this document) to address the workload required to adequately and appropriately support the development of IMPEI. These additional resources have been committed to the project for its duration.
- In September 2023, the project team documented all of the existing deficiencies in business rules and prepared needed lists to address the shortfalls, gaps due to regulation changes, changes in business needs. Vendor team used the requirements, business rules included within the RFO to implement the Release 1 deliverables. To mitigate future requests, the Project team implemented a Requirements Validation and Approval (RVA) exercise (described below). Furthermore, leading up to the development of these requests the Project Team implemented extensive discovery preparation sessions, that as a result, produced comprehensive documentation to provide the vendor with the technical context before moving on to development.
- In November of 2023, staff attrition within the project team created a necessity to pause development and execute a requirements validation and approval exercise to provide knowledge transfer to new/onboarded staff. This exercise delayed development from November through February (4 months). In response to mitigating future delays, the Project team has identified that onboarding and knowledge transfer with a project of this complexity requires careful planning and resource allocation to ensure that future attrition does not impact the schedule. To that end, the project team regularly provides updates on potential or known issues and engages in early

[1] EPA's Proposal to Update the Air Emissions Reporting Rule: Five Things to Know
[2] Air Emissions Reporting Requirements (AERR) | US EPA

mitigation (e.g., bringing in resources from other projects, initiating the hiring process before existing staff vacate their position, etc.).

Here is the RVA Report prepared after RVA effort completion:

3900_069_CARB_IMPEI_RVA_Report.pdf

Regulation Changes:

After the implementation and when Release 1 was delivered based on the originally provided business rules, staff realized shortcomings of the initial business rules that must be corrected. CARB determined that the Release 1 (R1) (i.e., data collection) business rules provided to the vendor did not meet CTR business needs. At this time, business program staff had gained formative IT Project experience they didn't have when developing the original business rules. Additionally, they had better foresight into CTR data collection challenges, drawing upon CTR implementation experience and feedback from stakeholders representing the thousands of facilities and 35 air districts that will be reporting. Unfortunately, this came after the original business rules had already been developed and provided to the vendor and after the vendor delivered R1.

With 2023 being the first year of implementation of enhanced reporting requirements under CTR, evaluating IMPEI needs during this first year of implementing the CTR regulation was important and instrumental to identifying the need for the proposed CTR changes. This initial year of experience plus a gap year for reporting in 2024 included in the CTR regulation has allowed CARB, the districts and facilities to identify challenges and work together to overcome them.

These challenges impacted the project's schedule, cost, and scope as described in Sections 3.2.2 & 4.5.3. Using experience and findings to date, CARB has refined the business rules to meet CTR requirements. Specifically, in September 2023, the project team documented all of the existing deficiencies in business rules and prepared needed requests to address the shortfalls. However, due to the limited unanticipated tasks budget, these requests were slotted for implementation through the Maintenance & Operations process.

3.4 Proposed Project Changes

The project schedule experienced delays due to several factors. A delayed release of the new IT Master Service Agreement (MSA) by Department of General Services (DGS) delayed the schedule. The Vendor team performed a Proof of Concept (POC) implementation to submit to Architecture Board with the initial design and a few Release 1 deliverables; which extended the project timelines further. Additionally, the PMO team requested to perform an in-depth requirements analysis due to the state of the existing requirements, further extending the schedule. Finally, provisioning the User Acceptance Testing (UAT) environment took longer than anticipated, contributing to the overall delay.

Background:

- A prior revision (SPR1 Update) extended the project schedule by approximately 30 months, leading to higher one-time costs.

- The project end date was originally set for June 28, 2020. SPR1 revised this to an October 30, 2023, go-live date.
- After the SPR1 Update was approved, the project went through schedule delays resulting in the SPR2.

Here is the high-level schedule that was highlighted in the previous SPR #1:

Major Milestones, Deliverables, Operations	Original Estimated Completion Date	Estimated Completion Date	Change (Months)
Implementation Solicitation Ready to Release	04/06/2018	01/07/2022	28
Implementation Contract Procurement	06/28/2018	04/14/2022	34
(Re-) Start Implementation	06/29/2018	06/15/2022	36
Implementation/Go Live	06/28/2020*	10/30/2023	36
Post Implementation Evaluation	12/31/2021*	10/30/2024	35
Project Closure	01/31/2021*	11/30/2024	36

ARB Program requested to delay the project kick-off until all the Vendor resources had been onboarded. The project kick-off was delayed to early September 2022. The project kickoff was delayed by about 6 weeks.

Initial project delays stemmed from two factors:

- **Extended Requirements Analysis:** The CARB Program requested an extension until mid-December due to competing priorities on the SMEs end and to thoroughly review and approve acceptance criteria for business requirements, delaying the schedule by 10 weeks.
- **IaC Script Development:** Unforeseen needs for building and testing Infrastructure as Code (IaC) scripts for the UAT environment pushed the IMPEI Environments Deliverable submission from January 31, 2023, to April 30, 2023.

Here are the series of events those caused initial delays and the associated versions of the schedule that was created:

Schedule Date	Solution Framework	R1 Dates	Go Live	Reason for Changes and Notes
9/26/2022	12/1/22 - 3/15/23	3/16/23 - 6/7/23	3/27/2024	Established baseline dates
11/1/2022	12/16/22 - 3/30/23	3/31/23 - 6/22/23	4/11/2024	Requirements clarification sessions where extended and pushed the start of Solution Framework

12/5/2022	12/21/22 - 4/6/23	4/7/23 - 6/29/23	4/18/2024	ARB SMEs asked to extend requirements by 2 weeks. Schedule was updated to reflect the change. (Noted in status report)
1/6/2023	1/3/23 - 5/1/23	4/18/23 - 7/10/23	4/29/2024	POC delivery date was pushed two weeks. Could not start Solution Framework until POC was approved.
3/24/2023	1/3/23 - 5/2/23	4/20/23 - 7/12/23	5/1/2024	Security deliverable rejected. ARB introduced new standards for IaC Scripts. This extends the Solution Framework. Minimal impact to build and go-live date.
04/08/2024	-	-	10/17/2024	Current

Here is the high-level schedule that is requested with the current SPR2:

Major Milestones, Deliverables, Operations	Original Estimated Completion Date	Estimated Completion Date	Change (Months)
Implementation Solicitation Ready to Release	04/06/2018	01/07/2022	28
Implementation Contract Procurement	06/28/2018	04/14/2022	34
(Re-) Start Implementation	06/29/2018	06/15/2022	36
Implementation/Go Live	10/30/2023	10/17/2024	10
Post Implementation Evaluation	10/30/2024	10/14/2025	11
Project Closure	11/30/2024	11/10/2025	11

Project Scope Update:

The initial Minimum Viable Product (MVP) included features in Phase 1 (P1), Phase 2 (P2), Phase 3 (P3), and Phase 4 (P4). Due to the Vendor's contract end date of 11/17/2024, the Project team reviewing the remaining scope and determined that the entire scope cannot be completed within the time frame available until Vendor's Contract expiration date. The project team revised the scope to include P1, P2, P3, and partial P4 as part of the MVP that is completed prior to the Vendor's contract end date. Both the MVP and post-MVP scope provides the IMPEI application with the needed functionality and meets the

Program teams' business objectives. All the project objectives are met with the MVP. A few lower priority (nice-to-haves) requirements within the Objectives were descoped from the original scope. A need for detailed requirements analysis is identified as a lesson learned for the Project team.

The scope for MVP includes the following:

a. Phase 1 – Solution Architecture/Design (unchanged and is part of MVP) – This Phase includes working on solution design to incorporate business and technical requirements that meet CARB's design and hosting infrastructure standards.

b. Phase 2 – Solution Framework Development (unchanged and is part of MVP) – This Phase includes beginning implementation on the approved solution design from Phase 1. Some modules implemented during this phase includes setting up public web portal, Identity and Access Management, User Dashboards.

c. Phase 3 – Core Module Development (unchanged and is part of MVP) – This Phase includes implementation of core modules such as Data Emission Collection, Data Augmentation, Data Inventory Compilation.

d. **Partial Phase 4 – Data Framework and User Interface (UI) for Cross Module Reports and Cross Module Search –** This Phase includes compiling, aggregating existing tables within IMPEI to develop a data framework for the following cross module reports and cross module searches. Building data framework is a crucial step as all of the data that is compiled and aggregated will be used after partial Phase 4 implementation to use the tables with existing UI screens and use it for querying purposes.

This functionality is critical and partial Phase 4 completion provides the required data framework for cross module reports and cross module search capabilities. Building UI on IMPEI application for all the below cross module reports and cross module searches is descoped from the MVP as lower priority and this effort has a minimal impact to CARB staff's day to day operations. CARB staff and Air Districts can still use existing UI screens after the partial Phase 4 implementation is complete.

- Facility Search Tool
- CEPAM2019v1.03
- Criteria Pollutant Emission Inventory Data
- Mobile Source Emissions
- Stationary Source Emissions
- Areawide Source Emissions
- Natural Source Emissions
- California Toxics Inventory
- Statewide Emissions | California Air Resources Board
- Emissions by Air District | California Air Resources Board
- Emissions by Air Basin | California Air Resources Board
- Community Emission Inventory

- CEPAM: 2022 PM2.5 Plans - Baseline Emission Projections - Tool Panel
- CEPAM: 2022 Ozone SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2019 Ozone SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2019 Regional Haze - Tool Panel
- CEPAM: 2016 SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2015 SJV MSM PM2.5 SIP - TOOL PANEL
- CEPAM: NORCAL 2012 PM 2.5 SIP Baseline Emission Projections - Tool Panel
- CEPAM: SOCAL 2012 PM 2.5 SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2007 Ozone SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2013 Almanac - Standard Emissions Tool
- CEPAM: 2009 Almanac - Standard Emissions Tool
- CEPAM: 2007 Almanac - Standard Emission Tool
- CEPAM: 2006 Almanac - Standard Emission Tool
- CEPAM: 2005 Almanac - Standard Emission Tool
- CEPAM: 2004 Almanac - Standard Emission Tool
- CEPAM: 2003 Almanac - Standard Emission Tool
- ONELINE Reporting Tool
- FOURLINE Reporting Tool
- EMISSIONS FOR AGGREGATED STATIONARY, AREA-WIDE, MOBILE, AND NATURAL SOURCES report
- EMISSIONS BY SUMMARY CATEGORY report
- Emissions by EIC Report

This Phase also includes building a UI for California Toxics Inventory (CTI) that displays the computed and derived Toxics information and provides users with the ability to download data in the form of a CSV file.

The descope of non-essential functionality includes the following:

a**. Descope of Phase 4 - Data Framework and User Interface (UI) for Cross Module Reports and Cross Module Search –** By the end of the contract (11/17/2024), all of the tables and infrastructure to support reports and search capabilities will be in place. Therefore, the Maintenance and Operations team will be able to set up reports and searches UI using the existing tables that were set up.

The following low priority data framework functionality for reports and search have been descoped from the original scope:

- Index of Methodologies by Major Category
- CEIDARS
- Emission Inventory Activities
- Integrated Summary Almanac

The following low criticality UI functionality for reports and search have been descoped from the MVP:

- Facility Search Tool
- CEPAM2019v1.03
- Index of Methodologies by Major Category
- Criteria Pollutant Emission Inventory Data
- Mobile Source Emissions

- Stationary Source Emissions
- Areawide Source Emissions
- Natural Source Emissions
- CEIDARS
- California Toxics Inventory
- Emission Inventory Activities
- Statewide Emissions | California Air Resources Board
- Emissions by Air District | California Air Resources Board
- Emissions by Air Basin | California Air Resources Board
- Emissions by County | California Air Resources Board
- Community Emission Inventory
- Integrated Summary Almanac
- CEPAM: 2022 PM2.5 Plans - Baseline Emission Projections - Tool Panel
- CEPAM: 2022 Ozone SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2019 Ozone SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2019 Regional Haze - Tool Panel
- CEPAM: 2016 SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2015 SJV MSM PM2.5 SIP - TOOL PANEL
- CEPAM: NORCAL 2012 PM 2.5 SIP Baseline Emission Projections - Tool Panel
- CEPAM: SOCAL 2012 PM 2.5 SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2007 Ozone SIP Baseline Emission Projections - Tool Panel
- CEPAM: 2013 Almanac - Standard Emissions Tool
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- CEPAM: 2005 Almanac - Standard Emission Tool
- CEPAM: 2004 Almanac - Standard Emission Tool
- CEPAM: 2003 Almanac - Standard Emission Tool
- ONELINE Reporting Tool
- FOURLINE Reporting Tool
- EMISSIONS FOR AGGREGATED STATIONARY, AREA-WIDE, MOBILE, AND NATURAL SOURCES report
- EMISSIONS BY SUMMARY CATEGORY report
- Emissions by EIC Report

CARB is requesting resources for staff augmentation to implement the final cross module reports and cross module searches to be completed during the Maintenance and Operations period. CARB staff are working closely with Vendor and Program partners to ensure that all the pre-work related to the cross module searches and reports are setup as part of MVP to assist in building the UI functionality during the Maintenance and Operations period. CARB staff are planning to prepare a staff augmentation that will support projects including IMPEI estimated at $450K. Depending on the RFO's dollar amount, the oversight information will be revealed.

3.4.1 Accessibility

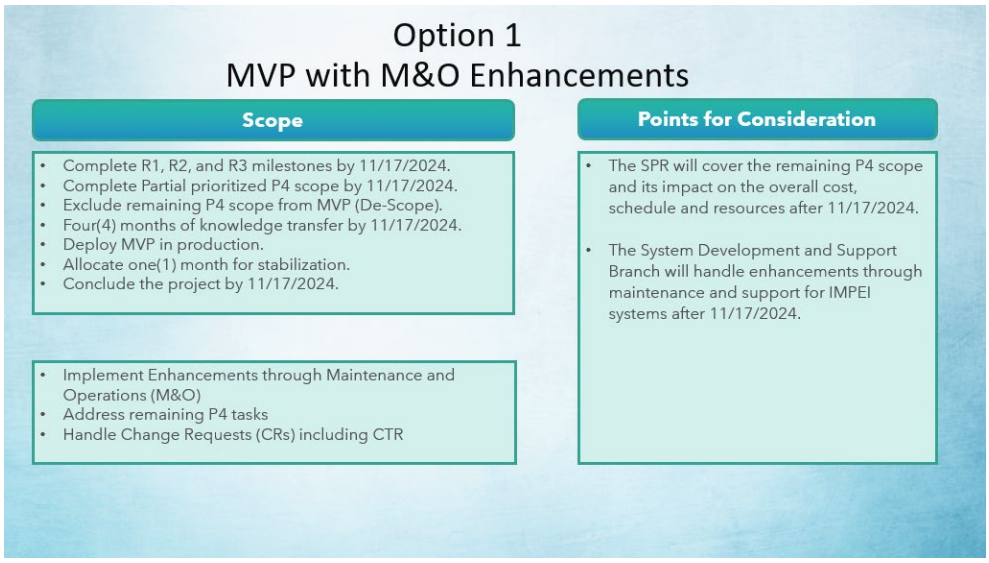
Not applicable to IMPEI

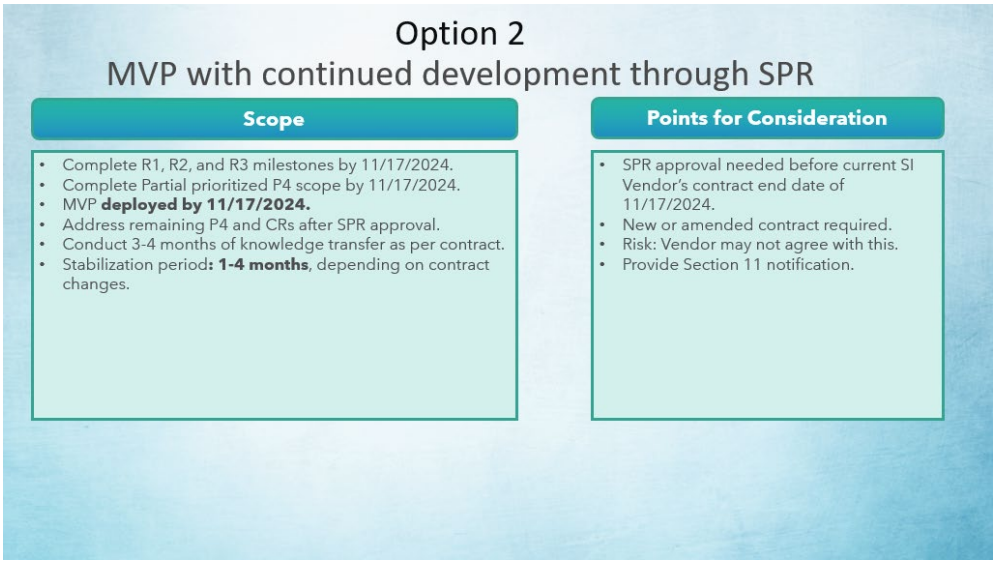
3.4.2 Impact of Proposed Changes on the Project

The proposed project adjustments prioritize delivering a Minimum Viable Product (MVP) by October 17, 2024, to align with the Vendor's contract end date of November 17, 2024. (Update as of November 21, 2024 – MVP was delivered on October 17, 2024 and is available in Production environment). This revised plan focuses on delivering core functionalities within the MVP to ensure a usable product with essential features reaches users by the new target date.

3.4.3 Feasible Alternatives Considered

Two options were considered to complete the IMPEI project. These options are noted below:





Initially, Option 2 was pursued due to regulatory timelines, maintaining vendor expertise and continuity, and some cost savings as described below (detailed $ amount cost savings are included in Section D Project Costs:

Regulatory Timelines. The regulatory implementation timelines to meet statutory requirements[3] require that CARB complete IMPEI by August 2025. The time that it would take to procure, bid and on-board a new contractor to an equivalent level of expertise as the current contractor would not be feasible before August 2025.

However, due to the tight timeline of the contract and the slow progress being made on the SPR and NCB it was not realistic or practical to pursue this path as the Contracts team communicated that the NCB would not be ready by the time MVP is delivered into Production environment. To ensure the success of the project, in June of 2024 the decision was made to pursue Option 1.

3.4.4 Vendor Contract Amendment

The Program, Vendor, and Project Team determined that the initial project objectives could not be accomplished within the timeline of the vendor's current contract. Therefore, a Minimum Viable Product (MVP) was defined to accommodate the minimum requirements to yield a usable product by the contract's end date.

The MVP was defined and agreed upon with the program, vendor, and project team by descoping and deferring to Maintenance and Operations (M&O) some requirements and application features. The changes are described in detail in Section 4.4 Proposed Project Changes.

The MVP will be completed by the contract deadline of November 15, 2024, as defined in the project schedule. The remainder of the initial scope, including the refinements identified in this SPR, will be completed in the Maintenance and Operation (M&O) phase. M&O team will be requesting funds, resources etc. required to complete the project components that will be developed and implemented during M&O.

The vendor and STP are aware of the descoping through multiple discussions and communications with the Project Team and Program, which will result in a reduced amount to be paid to the vendor and to be negotiated and finalized by STP. CARB Contracts & Procurement will work on preparing the amendment documents for CDT-STP team to review. Once they review, if additional changes are identified, CARB will work with CDT-STP to complete them. Once an amended scope is finalized with all supporting documents, CDT-STP will engage the contractor by sending a red-lined scope for their review and approval. CARB plans to complete the effort with STP before the Vendor contract expires. A risk is documented to capture the mitigation plan in case the amendment is not completed before the Vendor Contract expiration date (Risk Section 5.1).

[3] For example, sections of AB 617 require the development and use of the Integrated Multi Pollutant Emissions Inventory (IMPEI) database system as well as direct reporting by permitted facilities and were codified into California statute in 2017 (HSC 39607.1(b)).

Program team has worked to put the below table together to represent the 95% of the MVP scope for Phase 4 implemented by the Vendor team:

#	Deliverable Title	Bid Amount	Percentage in Scope	Updated Deliverable Amount
6.1	**Cross Module Reports**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.2	**Cross Module Search**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.3	**Updated Data Dictionary**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.4	**Updated Requirement Traceability**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.5	**Test Plan**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.6	**Test cases, test scripts, and test results**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.7	**Testing Defect Tracking Log(s)**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.8	**UAT Test Plan**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.9	**Developer Documentation**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.1	**Source Code**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.11	**Build Scripts**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.12	**Security: Static Code Analysis Report**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.13	**Security Testing Results**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.14	**Security Code Review Report**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
6.15	**Security Dynamic Analysis Report**	**$ 14,481.60**	**91.9%**	**$ 13,307.42**
	Task 6 Total	**$ 217,224.00**	-	**$ 199,611.24**

The following table reflects the amounts listed for Phase 4 implementation in the Contract Amendment 2:

#	Deliverable Title	Updated Deliverable Amount
6.1	**Cross Module Reports**	**$ 13,307.42**
6.2	**Cross Module Search**	**$ 13,307.42**
6.3	**Updated Data Dictionary**	**$ 13,307.42**
6.4	**Updated Requirement Traceability**	**$ 13,307.42**
6.5	**Test Plan**	**$ 13,307.42**
6.6	**Test cases, test scripts, and test results**	**$ 13,307.42**
6.7	**Testing Defect Tracking Log(s)**	**$ 13,307.42**
6.8	**UAT Test Plan**	**$ 13,307.42**
6.9	**Developer Documentation**	**$ 13,307.42**
6.1	**Source Code**	**$ 13,307.42**
6.11	**Build Scripts**	**$ 13,307.42**
6.12	**Security: Static Code Analysis Report**	**$ 13,307.42**
6.13	**Security Testing Results**	**$ 13,307.42**
6.14	**Security Code Review Report**	**$ 13,307.42**
6.15	**Security Dynamic Analysis Report**	**$ 13,307.42**
	Task 6 Total	**$ 199,611.24**

The following cost breakdown table from Contract Amendment 2 shows the amounts for all the deliverables:

Deliverable	%	Updated Deliverable Amount
Deliverable 1 – Project Management	10%	$ 217,224.00
Deliverable 2 – Requirements Analysis	5%	$ 108,612.00
Deliverable 3 – Functional Component Phase 1: Solution Architecture Design	10%	$ 217,224.00
Deliverable 4 – Functional Component Phase 2: Solution Framework Development	10%	$ 217,224.00
Deliverable 5 – Functional Component Phase 3: Core Module Development	40%	$ 868,896.03
Deliverable 6 – Functional Component Phase 4: Cross-Module / Inter-Application Development	10%	$ 199,611.30
Deliverable 7 – Transition and Go-Live	10%	$ 217,224.00

Deliverable 8 – Knowledge Transfer (KT)	5%	$ 108,612.00
TOTAL BASE CONTRACT COST		$ 2,154,627.33
10% UNANTICIPATED COST		$ 215,462.73
TOTAL CONTRACT COST		$ 2,370,090.06

A Transition Plan was put together by CARB's M&O team for the IMPEI application:

OIS IMPEI
Transition Plan.pdf

3.4.5 Implementation Plan

We propose a revised plan to achieve a Minimum Viable Product (MVP) by October 17, 2023. This plan prioritizes core functionalities aligned with the SI Vendor's contract, which extends to November 17, 2024. The program team has finalized the scope for this partial P4 MVP, and the Work Order Amendment (WOA) was approved by CARB and the Vendor team.

MVP will be implemented on 10/17/2024. Upon implementation, the following are performed:

Partial data migration from CEIDARS to IMPEI: This will be completed by November 17, 2024.

IMPEI System accepting district data: The system will be ready to receive district data starting in August 2025.

Remaining data migration: Any remaining data will be migrated after November 17, 2024, likely during November itself. The migration effort including any documentation to be submitted is planned to be completed by the M&O staff post November 17, 2024, during M&O phase.

CEIDARS retirement: CEIDARS will be decommissioned by March 2026, once the IMPEI system is fully operational.

While the IMPEI System will be ready for district data intake in August 2025, the extended timeframe allows for a dedicated training period between October 2024 and July 2025. This will equip district users with the necessary skills and knowledge to effectively utilize the new system.

Development & Iteration (Ongoing):

We will collaborate with the SI Vendor to develop and iterate on prioritized MVP features using a hybrid agile approach. While the development and testing will be iterative, a single, comprehensive deployment of the MVP is planned. Conduct regular reviews with stakeholders to ensure alignment with the original requirements.

User Acceptance Testing (Targeted before October 17, 2024, Currently in Progress):

Vendor has submitted a UAT plan to test the MVP, involving user participation and addressing any identified issues. PMO Team has provided feedback to Vendor. Vendor is currently addressing the feedback.

Deployment & Launch (October 17, 2024):

The IMPEI system was launched on October 17, 2024, marking a significant milestone in our transition from the CEIDARS system. One month of stabilization period is observed after the deployment date. This launch signifies an extensive development and testing efforts, ensuring a stable and functional platform for the California district users of the IMPEI system.

To facilitate a smooth user experience, a comprehensive deployment plan has been established. This plan will involve:

- **System Deployment:** The MVP (Minimum Viable Product) of the IMPEI system will be deployed to the designated production environment on October 17, 2024.
- **User Training Completion:** By launch day, all necessary user training materials, knowledge transfer will have been completed, beyond which IMPEI will start receiving the district data from August of 2025. The district personnel will be trained between the November 2024 through July 2025 with the knowledge and skills to effectively utilize the IMPEI System. Few of the IMPEI district users will also be participating in the Pilot prior to August of 2025, the plan is still being worked on by the Program Team.
- **Post-Launch Support:** Post-Launch Support (1 Month of Stabilization period from October 17, 2024, to November 17, 2024). Post November 17th, 2024, M&O team will be available to address any user inquiries or technical issues arising after deployment, during the M&O phase. In addition, enhancements requests will be assessed for implementation via staff augmentation.

4. Updated Project Management Plan

4.1 Project Manager Qualifications

The IMPEI project is managed by a contract Senior Project Manager (PM). The role of the PM is to establish and implement the necessary project management processes, maintain the overall project documentation, and project reporting. The PM for the IMPEI project is Kalyani Ghare. Kalyani Ghare is within the Project Management Office of CARB's Office of Information Services (OIS). She is certified as a Project Management Professional (PMP) by the Project Management Institute (PMI).

4.2 Project Management Methodology

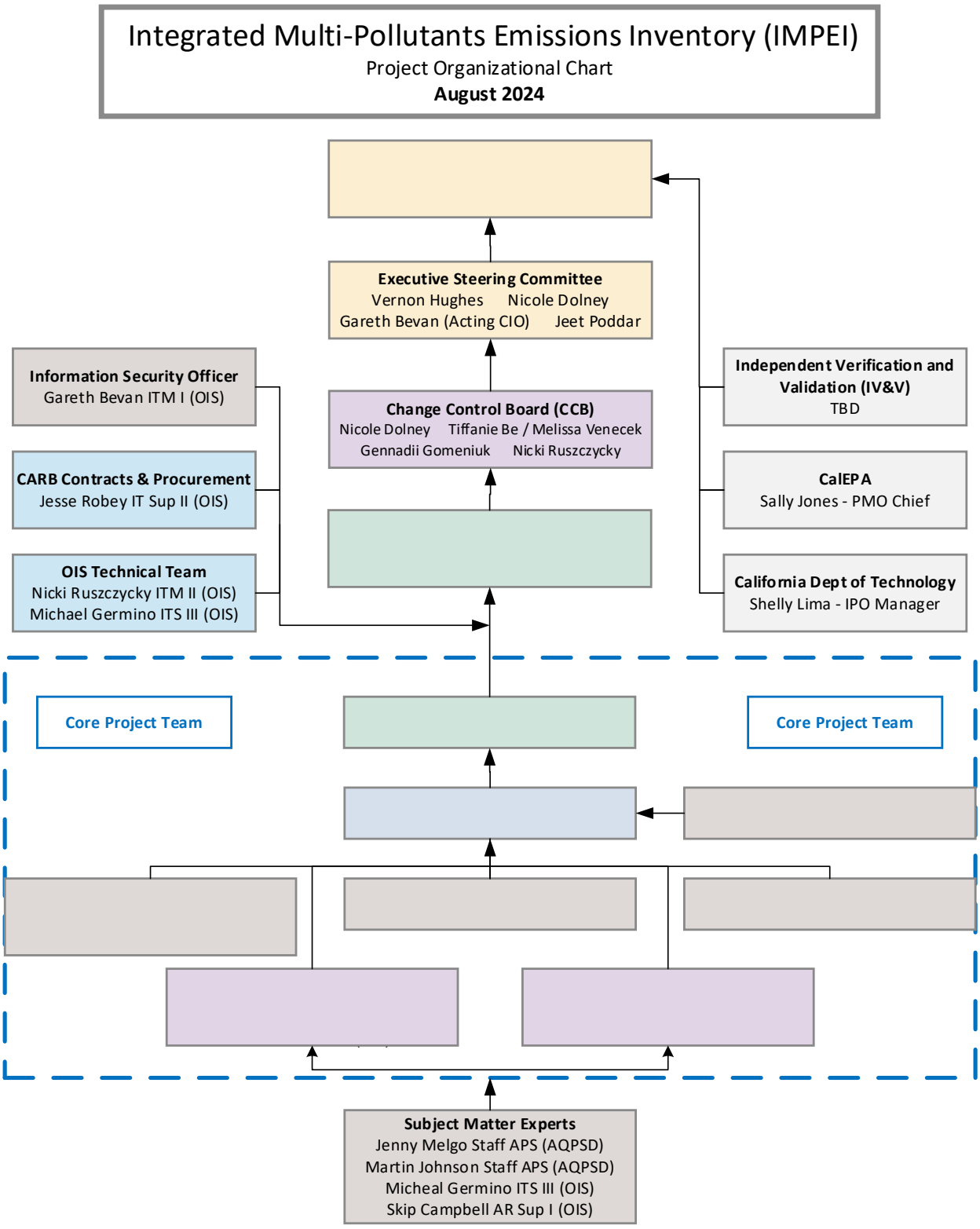
The California Air Resources Board will utilize the California Project Management Framework (CA-PMF) in conformance with project management practices that conform to industry standards as defined by the Project Management Institute (PMI) and are adapted to the context of California State government. The Framework includes all major project processes and activities, from initial project definition to project closing. Additionally, the Framework also provides models for both the management tools and plans used to document and manage the project. The California Air Resources Board will be using a hybrid approach with a combination of waterfall and agile best practices.

4.3 Project Organization

The roles and responsibilities of the team are listed in the Governance Plan (below):

3900_069_CARB_IM
PEI_Governance_Pla

See Project Organization Chart:


Integrated Multi-Pollutants Emissions Inventory (IMPEI)
Project Organizational Chart
August 2024
Executive Steering Committee
Vernon Hughes Nicole Dolney
Gareth Bevan (Acting CIO) Jeet Poddar
Information Security Officer
Gareth Bevan ITM I (OIS)
Change Control Board (CCB)
Nicole Dolney Tiffanie Be / Melissa Venecek
Gennadii Gomeniuk Nicki Ruszczycky
Independent Verification and Validation (IV&V)
TBD
CARB Contracts & Procurement
Jesse Robey IT Sup II (OIS)
CalEPA
Sally Jones - PMO Chief
OIS Technical Team
Nicki Ruszczycky ITM II (OIS)
Michael Germino ITS III (OIS)
California Dept of Technology
Shelly Lima - IPO Manager
Core Project Team
Core Project Team
Subject Matter Experts
Jenny Melgo Staff APS (AQPSD)
Martin Johnson Staff APS (AQPSD)
Micheal Germino ITS III (OIS)
Skip Campbell AR Sup I (OIS)

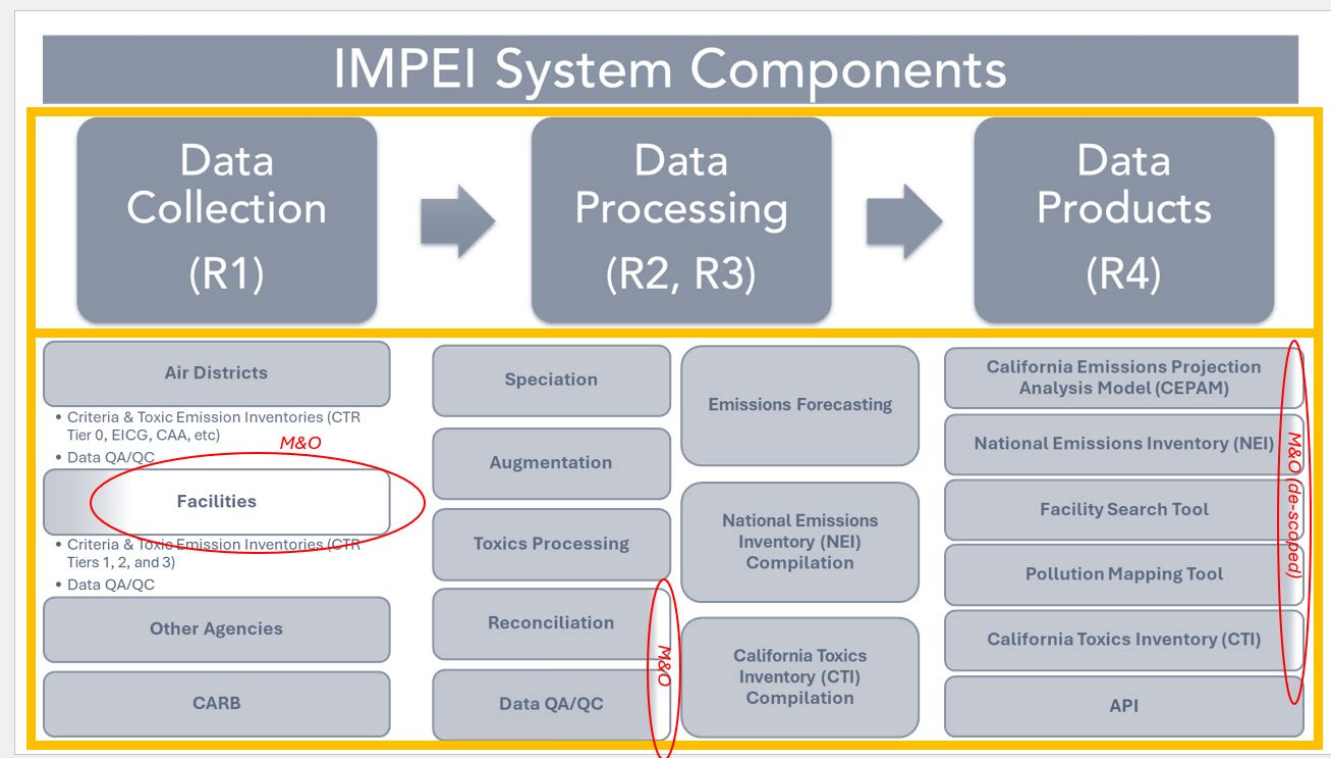
4.4 Project Priorities

No changes in Project Priorities since SPR 1 Update.

4.5 Project Plan

4.5.1 Project Scope

The scope of the project includes a partial de-scoping of Phase 4; a partial implementation of Phase 4 will be incorporated as part of the minimum viable product (MVP). Here is a quick summary of the entire Project Scope for the IMPEI application (includes MVP and M&O):



Phase 4 MVP includes the creation of a User Interface for Toxics Inventory Compilation using Facility, California Toxics Inventory (CTI tables). It also includes the development of two data frameworks (CTI & Facility Search Tool) comprising multiple data tables developed in Release 1, Release 2, and Release 3. The solution incorporates a repeatable process for transferring data from existing IMPEI tables to data tables within IMPEI, enabling the compilation and aggregation of data for future report consumption.

High-level description of the partial implementation of Phase 4 will be incorporated as part of the minimum viable product (MVP).

- Phase 4 MVP includes the development of two data frameworks (CTI & Facility Search Tool), which consist of a series of tables (at least one table for each tool) that restructure data that already exists within IMPEI so that it can be easily displayed as results for the search tools.
- The Facility Search Tool is a user interface query tool and search results will, at a minimum, replicate the functionality of the existing tool: https://ww2.arb.ca.gov/applications/facility-search-engine. The UI is not a deliverable for this phase, only the data framework supporting the UI is the deliverable.

- The solution incorporates transfer of Facility Search tool data tables from existing IMPEI Live tables to the newly developed Publication Schema tables.
- This will be triggered by a UI button for ad hoc functionality.
- The CTI Tool is a user interface query tool that will have the capability of querying the columns in the CTI schema and displaying search results from those tables (See BR 66). The UI is not a deliverable for this phase, only the data framework supporting the UI is the deliverable.
- The solution incorporates a UI for compilation and aggregation of existing CTI tables for staff to be able to download (.csv) and upload compiled CTI data table within IMPEI (BR 66).
- The fields for the CTI Tool will include: ID, EIC, EIC1, EICSUM, EICSOU, EICMAT, TYPE, YR, CO, AB, DIS, FACID, DEV, PROID, SIC, NAICS, SCC, REIC, POL, EMS <EMS or UNREMS>, CANCERTWE, CHRONICTWE, ACUTETWE, MAXHOURACUTETWE, SRC, SRCID, VALUE_CAT, CR_FLAGS, NOTE, REF_LABEL, DATE_TIMESTAMP, USER * Inputs for "EMS" are selected ems or unrems values by TISPS staff as described in the BR

The following tables represent the Phase 4 deliverables including the acceptance criteria from the partial Phase 4 Work Order Authorization (WOA) (Phase 4 WOA was approved by CARB and Vendor team):

- Under Contract's task table - Task 6, there are 38 "reports" identified as deliverables.
- Contractually, these "reports" need to be **created** and then **published** on a webpage.
- Unfortunately, the current contract timeline does not allow sufficient time to **publish** all reports.
- MVP ensures that we have all the data frameworks for these products and that data will be available in the IMPEI Publication schema. The remaining work to publish the data on webpages was de-scoped and will occur under M&O.
- Program and OIS M&O teams researched the scope and estimated that about 95% of the scope will be fully developed as part of the MVP. The scope includes creation of the data frameworks, a user interface for the compilation of the toxics inventory, and make the data available in the IMPEI Publication Schema.
- The remaining 8% of Phase 4 scope will be completed under M&O.
- Here is an overview of the M&O Scope:

M&O Scope
Phase 4 (remaining scope - 5%)
BR.009 Methodology File Reminder for Area Sources
CTR Regulation (Tier 0/1)
CTR Regulation (Tier 2/3)
Additional QAQC for Toxics (Second Triggering Event)
Emissions Reconciliation Part B
Emissions Reconciliation Part C
Legacy Data Migration
Revised Data Dictionary Template

Knowledge Transfer

Here are the Requirements that are part of the Phase 4 within MVP:

- **Facility Search Tool** (RQ- 66, 67, 68, 69, 70, 71, 75) These requirements should be included in Phase 4 Sprint 1; however only the framework for creating data would be developed; the public report itself would be addressed in the SPR 2.
- **California Toxics Inventory** (RQ-73, 74 and 82) MVP for data covered by tackling BR066 to R3 Sprint 1; public web report covered in SPR 2

Here are the Requirements that are part of the Phase 4 post MVP:

RQ-55 (Report), 56, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 81, 82, 90
BR.059, BR.060.

The Requirements with description are listed in the below table (the requirement documents are added as part of the SPR Package):

#	Requirement
RQ-55	The system shall display inventory scenarios at various levels of aggregation across facility, region, source category, pollutant and time.
RQ-66	The system shall replicate the functionality of CARB's Facility Search tool and allow a user to generate a list of facilities matching given criteria, such as name, location or region, and industrial classification. The Facility Search tool can be viewed at https://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php
RQ-67	The system shall display facility details such as emissions, name, location, and industry, along with any available health risk data, for the Facility Search.
RQ-68	The system shall show the search criteria and results list on the same screen, with the results list automatically updating after a menu item has changed.
RQ-69	The system shall generate facility emissions reports, collectively referred to as the Facility Emissions Report, which detail all applicable pollutant regimes (criteria, toxics, and GHG) for every facility.
RQ-70	The system shall show emission trends for a given facility spanning multiple years on the Facility Emissions Report.
RQ-71	The system shall show emissions in both tabular and graphical formats, including line and bar charts, on the Facility Emissions Report.
RQ-72	The system shall replicate the functionality of CARB's CEPAM web tool and allow a user to generate a regional planning inventory summary showing emissions for a given region and time period at various detail levels of emission category. The CEPAM web tool can be found at https://ww2.arb.ca.gov/applications/cepam2019v103-standard-emission-tool.
RQ-73	The system shall display emissions from all pollutant regimes in a consistent format using CARB defined spatial and category mappings on the Integrated Emissions Summary Tool.
RQ-74	The system shall display results in both tabular and graphical formats on the Integrated Emissions Summary Tool.

RQ-75	The system shall show the search criteria and results list on the same screen, with the results list automatically updating after a menu item has changed.
RQ-76	The system shall provide a report displaying the baseline emissions trend along with the associated growth and control profiles.
RQ-81	The system shall allow a user to group by the predefined EIC or source categories levels, and region for the Community Inventory report.
RQ-82	The system shall provide a web based report showing annual top ten toxic weighted emissions (TWE) by source, county and community. The top ten toxic weighted emissions shall be based on cancer risk, non-cancer chronic and non-cancer acute risk. The report shall flag community TACs emissions that greater than the county level emissions.
RQ-90	The system shall output emission inventory methodologies for estimating emissions by source categories and by EIC.
BR-059	Forecasting Module: Emission Reporting - “Internal” “Baseline” Web Reporting - The system will provide functionality for “Internal” CARB and District end-users to run emission reports for the “baseline” emissions. The look and feel should be analogous to the current CEPAM web reporting portal (link below).
BR-060	Forecasting Module: Emission Reporting - “Internal” “Adjusted” Web Reporting - The system will provide functionality for “Internal” CARB and District end-users to run emission reports with “external adjustments” applied “on the fly”. The look and feel should be analogous to the current CEPAM web reporting portal (link below).

Deliverable	Acceptance Criteria
6.1 Cross Module Reports	a) Compile and aggregate existing tables within IMPEI to develop a data framework consisting of at least one table for the following Cross Module Reports: i. Mobile Source Emissions ii. Stationary Source Emissions iii. Areawide Source Emissions iv. Natural Source Emissions v. California Toxics Inventory vi. Statewide Emissions | California Air Resources Board vii. Emissions by Air District | California Air Resources Board viii. Emissions by Air Basin | California Air Resources Board ix. Emissions by County | California Air Resources Board x. Community Emission Inventory xi. Integrated Summary Almanac xii. CEPAM: 2022 PM2.5 Plans - Baseline Emission Projections - Tool Panel xiii. CEPAM: 2022 Ozone SIP Baseline Emission Projections - Tool Panel xiv. CEPAM: 2019 Ozone SIP Baseline Emission Projections - Tool Panel xv. CEPAM: 2019 Regional Haze - Tool Panel xvi. CEPAM: 2016 SIP Baseline Emission Projections - Tool Panel xvii. CEPAM: 2015 SJV MSM PM2.5 SIP - TOOL PANEL xviii. CEPAM: NORCAL 2012 PM 2.5 SIP Baseline Emission Projections - Tool Panel xix. CEPAM: SOCAL 2012 PM 2.5 SIP Baseline Emission Projections - Tool Panel xx. CEPAM: 2007 Ozone SIP Baseline Emission Projections - Tool Panel xxi. CEPAM: 2013 Almanac - Standard Emissions Tool xxii. CEPAM: 2009 Almanac - Standard Emissions Tool xxiii. CEPAM: 2007 Almanac - Standard Emission Tool xxiv. CEPAM: 2006 Almanac - Standard Emission Tool xxv. CEPAM: 2005 Almanac - Standard Emission Tool xxvi. CEPAM: 2004 Almanac - Standard Emission Tool xxvii. CEPAM: 2003 Almanac - Standard Emission Tool xxviii. ONELINE Reporting Tool xxix. FOURLINE Reporting Tool xxx. EMISSIONS FOR AGGREGATED STATIONARY, AREA-WIDE, MOBILE, AND NATURAL SOURCES report xxxi. EMISSIONS BY SUMMARY CATEGORY report xxxii. Emissions by EIC Report b) Build a User Interface for California Toxics Inventory (CTI) that displays the computed and derived Toxics information and provides users with the ability to download data in the form of a CSV file. c) User Acceptance Testing has been completed successfully.
6.2 Cross Module Search	a) Complete Facility Search data tables transfer from existing IMPEI Live tables to newly developed Publication Schema tables. b) Compile and aggregate existing tables within IMPEI to develop a data framework consisting of at least one table for the following Cross Module Searches: i. Facility Search Tool ii. CEPAM2019v1.03 iii. Criteria Pollutant Emission Inventory Data c) User Acceptance Testing has been completed successfully

Deliverable Name(s)			MVP Scope (Will be delivered by 11/17/2024)		M&O Team (Items that are descoped from Phase 4)	
#	Contract Deliverable #	Phase 4 Report or Search Name(s)	Will data framework be completed as part of MVP (Yes/No)?	Will this deliverable be completed as part of MVP (Yes/No)?	Will data framework be delivered by M&O Team (Yes/No)?	Will be delivered by the M&O Team (Yes/No)?
1	6.2 Cross Module Search	Facility Search Tool	Yes	No	No	Yes
2	6.2 Cross Module Search	CEPAM2019v1.03	Yes	No	No	Yes
3	6.2 Cross Module Search	Index of Methodologies by Major Category	No	No	Yes	Yes
4	6.2 Cross Module Search	Criteria Pollutant Emission Inventory Data	Yes	No	No	Yes
5	6.1 Cross Module Reports	Mobile Source Emissions	Yes	No	No	Yes
6	6.1 Cross Module Reports	Stationary Source Emissions	Yes	No	No	Yes
7	6.1 Cross Module Reports	Areawide Source Emissions	Yes	No	No	Yes
8	6.1 Cross Module Reports	Natural Source Emissions	Yes	No	No	Yes
9	Removed	Neighborhood (Chapis)	Removed	Removed	Removed	Removed
10		CEIDARS	No	No	Yes	Yes
11	6.1 Cross Module Reports	California Toxics Inventory	Yes	No	No	Yes
12		Emission Inventory Activities	No	No	Yes	Yes
13	6.1 Cross Module Reports	Statewide Emissions | California Air Resources Board	Yes	No	No	Yes

14	6.1 Cross Module Reports	Emissions by Air District | California Air Resources Board	Yes	No	No	Yes
15	6.1 Cross Module Reports	Emissions by Air Basin | California Air Resources Board	Yes	No	No	Yes
16	6.1 Cross Module Reports	Emissions by County | California Air Resources Board	Yes	No	No	Yes
17	6.1 Cross Module Reports	GHG Inventory Query Tool	Removed	Removed	Removed	Removed
18	6.1 Cross Module Reports	Community Emission Inventory	Yes	No	No	Yes
19	6.1 Cross Module Reports	Integrated Summary Almanac	No	No	Yes	Yes
20	6.1 Cross Module Reports	CEPAM: 2022 PM2.5 Plans - Baseline Emission Projections - Tool Panel	Yes	No	No	Yes
21	6.1 Cross Module Reports	CEPAM: 2022 Ozone SIP Baseline Emission Projections - Tool Panel	Yes	No	No	Yes
22	6.1 Cross Module Reports	CEPAM: 2019 Ozone SIP Baseline Emission Projections - Tool Panel	Yes	No	No	Yes
23	6.1 Cross Module Reports	CEPAM: 2019 Regional Haze - Tool Panel	Yes	No	No	Yes
24	6.1 Cross Module Reports	CEPAM: 2016 SIP Baseline Emission Projections - Tool Panel	Yes	No	No	Yes
25	6.1 Cross Module Reports	CEPAM: 2015 SJV MSM PM2.5 SIP - TOOL PANEL	Yes	No	No	Yes
26	6.1 Cross Module Reports	CEPAM: NORCAL 2012 PM 2.5 SIP Baseline Emission Projections - Tool Panel	Yes	No	No	Yes

27	6.1 Cross Module Reports	CEPAM: SOCAL 2012 PM 2.5 SIP Baseline Emission Projections - Tool Panel	Yes	No	No	Yes
28	6.1 Cross Module Reports	CEPAM: 2007 Ozone SIP Baseline Emission Projections - Tool Panel	Yes	No	No	Yes
29	6.1 Cross Module Reports	CEPAM: 2013 Almanac - Standard Emissions Tool	Yes	No	No	Yes
30	6.1 Cross Module Reports	CEPAM: 2009 Almanac - Standard Emissions Tool	Yes	No	No	Yes
31	6.1 Cross Module Reports	CEPAM: 2007 Almanac - Standard Emission Tool	Yes	No	No	Yes
32	6.1 Cross Module Reports	CEPAM: 2006 Almanac - Standard Emission Tool	Yes	No	No	Yes
33	6.1 Cross Module Reports	CEPAM: 2005 Almanac - Standard Emission Tool	Yes	No	No	Yes
34	6.1 Cross Module Reports	CEPAM: 2004 Almanac - Standard Emission Tool	Yes	No	No	Yes
35	6.1 Cross Module Reports	CEPAM: 2003 Almanac - Standard Emission Tool	Yes	No	No	Yes
36	6.1 Cross Module Reports	ONELINE Reporting Tool	Yes	No	No	Yes
37	6.1 Cross Module Reports	FOURLINE Reporting Tool	Yes	No	No	Yes
38	6.1 Cross Module Reports	EMISSIONS FOR AGGREGATED STATIONARY, AREA-WIDE, MOBILE, AND NATURAL SOURCES report	Yes	No	No	Yes

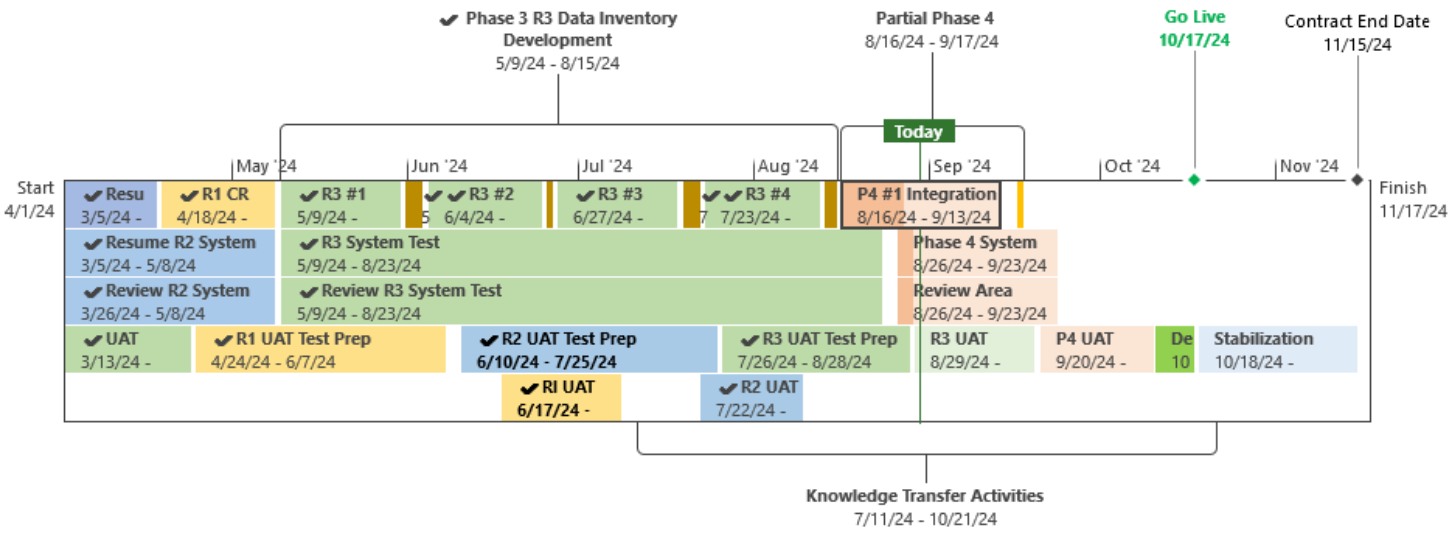
39	6.1 Cross Module Reports	EMISSIONS BY SUMMARY CATEGORY report	Yes	No	No	Yes
40	6.1 Cross Module Reports	Emissions by EIC Report	Yes	No	No	Yes

4.5.2 Project Assumptions

Assumptions/Constraints	Description/Potential Impact
Assumption: Program staff will be available.	There will be adequate staff available from the Air Quality Planning and Science Division to define the vision/scope, requirements, and design; and to support the development, testing, and deployment of the application. Inadequate staffing will impact schedule and quality.
Assumption: Office of Information Services staff will be available	There will be adequate Server and Networking staff available to provide services as required. Unavailability will impact the schedule.
Assumption: Dedicated staff will remain in their current roles	Staff assigned to the project will remain in their current roles. Reassignment of staff will impact the schedule.
Assumption: Project funding will be approved and available	The project budget has been approved and will remain available throughout the project lifecycle. Funding non-availability will impact quality, schedule, and resources.
Assumption: The current system will remain available.	The current system will remain in production and maintained until the replacement system is brought into production. Failure to do so will impact CARB's ability to provide emission inventories in support of multiple state and federal mandates
Assumption: All base hardware/software requirements will be met with the existing CARB infrastructure	All base hardware/software requirements will be met with existing CARB infrastructure.
Constraint: Legacy data will be converted to a format usable by the new system.	The legacy system data may not be in a usable format. Prior to executing the project, a method for converting the legacy data into a format usable by the new system will be determined. Failure to do so will impact legacy data availability, schedule, and quality.
Assumption: Training	The program will provide personnel for "Train the Trainer" sessions and will provide training to program staff.
Constraint: Scope.	The project's scope is constrained to the Air Quality Planning and Science Division. Expanding the scope will impact the schedule and budget.
Assumption: Contracted work.	It is assumed that services will be procured to develop and implement the chosen solution as required. Migration of legacy data and any required training is also included in this assumption. It is anticipated that a Request for Offer (RFO) will be released for prospective service providers to bid on.

4.5.3 Project Phasing

The Project Phases at a high level view are provided below:



4.5.4 Project Roles and Responsibilities

Since the SPR1 update, some roles and responsibilities (Governance Plan is included in Appendix B) have been shared during periods of staff shortages and attrition. For instance, the program acted as a PM in conjunction with the previous BA, the program provided contract support while onboarding a Contracts and Procurements team, and Business Analysts acted as PMs and BAs concurrently in the absence of a PM.

However, as mentioned previously, CARB has addressed the staffing shortage by bringing on adequate staff resources and establishing a stable team to minimize further attrition. The resources include PM, BAs, Contracts team members, OIS Technical Leads. OIS Technical Leads will eventually be a part of the Maintenance and Operations (M&O) phase for the IMPEI project.

4.5.5 Project Schedule

The below project schedule tasks represent all the activities performed within the IMPEI Project:

OIS_IMPEI_Project_Master_Schedule_09

OIS_IMPEI_Project_Master_Schedule_09

4.6 Project Monitoring and Oversight

4.6.1 Tracking and Reporting

Tracking and reporting on project deliverables, schedule, and budget is crucial for ensuring the IMPEI project stays on track and within allocated resources. Here's a structured process followed:

1. **Establish Baselines:**
    - Project Deliverables: Define and document project deliverables. This includes scope and acceptance criteria.
    - Project Schedule: Develop a detailed project master schedule outlining tasks, dependencies, milestones, and deadlines.

- Project Budget: Monitor budget allocation for resources and other costs associated with the project as stated in the FAW.

2. **Monitoring Progress:**
   - Regularly monitor the actual progress against the planned deliverables, schedule, and budget. Weekly and bi-weekly meetings are scheduled regularly to address potential deviations and risks.
   - Use MS Project tool to track tasks, deadlines, resource utilization, and expenditures.
3. **Collecting Data:**
   - Gather data from team members, stakeholders, and project management tools to compile accurate information on deliverables completed, tasks in progress, and any potential issues or delays.
4. **Analyzing Data:**
   - Compare actual progress, expenditures, and resource utilization against the planned baseline. Identify any variances or deviations.
   - Determine the causes of any discrepancies (e.g., scope changes, resource constraints, unanticipated) and assess their impact on the project's timeline and budget.
5. **Reporting:**
   - Prepare regular status reports or updates for stakeholders detailing:
     - Status of deliverables: What has been completed, what is in progress, and any pending items.
     - Schedule status: Progress against milestones, any delays, and adjustments made to the timeline.
     - Budget status: Expenditures to date, remaining budget, and any significant deviations from the planned budget.
   - Reports include internal Weekly Status Reports and Project Status Reports (PSR) submitted monthly to CDT.
6. **Communicating with Stakeholders:**
   - Share status updates and reports with stakeholders in weekly and bi-weekly scheduled meetings, emails, SharePoint, and MS teams.
   - Address any concerns, risks, or changes that may affect the project's deliverables, schedule, or budget.
7. **Taking Corrective Actions:**
   - If variances are identified, collaborate with the project team to develop corrective actions or adjustments to bring the project back on track.
   - Update the project plan, schedule, or budget as necessary based on approved changes and ensure all stakeholders are informed.
8. **Documenting Changes:**
   - Maintain a Change Request Log to document any changes made to the project scope, schedule, or budget throughout the project lifecycle.
   - Ensure changes are presented to the corresponding governing body following the IMPEI Governance Plan.
9. **Review and Continuous Improvement:**
   - Conduct periodic reviews of the tracking and reporting process to identify areas for improvement.
   - Implement lessons learned from the project to enhance future project tracking and reporting practices.

By following these steps, the IMPEI project team effectively tracks and reports on deliverables, schedule, and budget, ensuring transparency, accountability, and alignment with stakeholders' expectations.

4.6.2 Complexity Assessment

The Complexity Assessment for the IMPEI project is listed below – the Security level for the IMPEI application is changed from Low to Moderate from the time of the project initiation to date:

IMPEI Project Complexity Matrix.xl

4.6.3 Changes in Independent Oversight

Since SPR1 update, CalEPA has been included in the IMPEI project with the role of advisors.

4.7 Project Quality

The project uses the processes, procedures, and activities described in the IMPEI Quality Management Plan. This plan conforms with the standards and practices recommended within the CA-PMF.

4.8 Change Management

The project uses the processes, procedures, and activities described in the IMPEI Change Management Plan. This plan conforms with the standards and practices recommended within the CA-PMF.

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4.9 Authorization Required

The IMPEI project does not require any special authorization. However, we will consult with the Agency and CDT to determine otherwise.

5. Updated Risk Management Plan

The project uses the processes, procedures, and activities described in the IMPEI Risk Management Plan. This plan conforms with the standards and practices recommended within the CA-PMF.

3900_069_CARB_IMPEI_Risk_Manageme

5.1 Risk Register/ Risks and Issues Log

There is one **Issue** on the IMPEI Log:

High Level Issue Description	Mitigation Plan	Continency Plan	Teams' Actions Taken
IV&V Gap in service	Project team to continue to operate and work with Contracts team in collaboration to resolve.	PMO to work closely with Project teams to help validate the project quality, best practices.	• Project team has worked with Contracts team to help share the details on the IV&V

			deliverables and continue to collaborate.

The project team identified a few **High Priority risks** in the following areas:

High Level Risk Description	Mitigation Plan	Continency Plan	Teams' Actions Taken
Contracts Team is Overloaded	1. Work closely with the contracts team and leadership to assess resource needs and identify areas for improvement 2.Advocating for additional resources for the contracts team to help with the workload and address issues promptly. 3.Engage leadership in prioritizing resource allocation to ensure timely responses and project handling by the contracts team.	Conduct regular reviews with the contracts team and leadership to monitor progress, identify bottlenecks, and adjust resource allocation as needed	Project team is working closely with the Contracts team and sending documents for Contracts teams' review within the window specified.
Ineffective UAT due to Knowledge acquisition gap	Work with PMO team to gain training on UAT processes	1. Shadow UAT team to perform testing. 2. PMO team to setup working sessions and perform tests with UAT testers together with discussions on each test case and results.	UAT Training sessions have been conducted for the UAT Testers to help with the UAT activities and the team is available throughout the entire process of UAT assisting testers with any questions.
UAT test case completeness gaps	Track and assist the process of UAT Test Case creation, updates. Recommend best practices to update the Test Cases.	Work with UAT testing team while test cases preparation activities are performed within working sessions and update the test cases together with the testing team.	• UAT Training sessions covered the best practices for writing the test cases. • Before every UAT cycle, PMO has been reviewing the test cases along with IV&V and providing input to testers for adjustments on Release 1 test

			cases. This effort continued with PMO for Release 2 test cases. • UAT Test cases and scenarios review is planned for each release and end to end UAT testing cycles in the schedule. •
Unclear Data Migration Scope with Vendor	Clearly outline remaining data to migrate details and timelines considering the SI vendor's contract end date of 11/17/2024	Collaborate with the program team to secure the data migration plan before the MVP and during the M&O phase. Ensure that the data migration knowledge transfer (KT) and Glue jobs transition are completed promptly and agreed upon by both the program and OIS teams. Coordinate the program and OIS teams to carry out the required testing.	• Project team is working together to discuss the scope for Data Migration and to map out the plan for completing the migration activities.
Inadequate Performance Testing Environment	Define Testing Environment: Clearly document the decision and plan for obtaining a suitable performance testing environment. Alternatives: If a production-sized environment isn't feasible, explore alternative testing environments that adequately represent real-world conditions.	Conduct Performance Testing on Development or UAT environment	• Project team is working with OIS team to discuss the Performance Testing Environment setup. • OIS team performed the first Performance Test on UAT environment with updated DB resources and the tests went well. This test helped to assess the next set of Performance tests' need.

Delays in Contract Amendment Approval from STP	Regularly follow up with STP on the Contract Amendment status and prepare alternative actions if delays occur.	Identify and document alternative actions or adjustments in case of delays.	• Project team is working with Contracts team closely to facilitate the contract amendment discussions and to share needed materials.

At this time, the project team has not raised any Critical Risks and one of the Risks have turned into Issues (Gap in IV&V services). The team is continuing to monitor the project activities, current Issues and Risks logs to assess the need for adding new Risks/Issues or closing the current Risks/Issues after teams' discussion.

5.2 IV&V Findings and Project Responses

IV&V team performed briefing with all the project team members and shared Findings from those discussions, the project team implemented Action Plans addressing the findings and have documented a future implementation plan to address the findings during the course of the Project. The details are listed below:

Finding 1: Roles and Responsibilities of the project team members are not clearly understood nor adhered to at times.

Actions Taken:

- Governance Plan was updated to include roles and responsibilities of each project's position and the review cycles helped with getting clarity on all aspects of the Governance Plan including roles and responsibilities.
- UAT Training was conducted, and specific modules were designed to train the UAT team members (Program staff) on roles and responsibilities during all phases of development and testing activities.

Actions Planned:

- Continue training as needed to project team on roles and responsibilities.

Finding 2: Observed opposition to the PMO.

Actions Taken:

- Project team began initial discussions on Organizational Change Manage (OCM) effort with Program, OIS teams.

Actions Planned:

Work together with Program, OIS teams to continue and complete the Organizational Change Manage (OCM) effort.

Finding 3: Work environment is experienced as less than professional.

Actions Taken:

- Executive teams met with Project teams to communicate expectations.

Actions Planned:

Continue open communication within the project teams and resolve any roadblocks.

Finding 4: There is a clear indication of dysfunction across the IMPEI project team.

Actions Taken:

- None

Actions Planned:

Meet with Project team as time allows for a virtual or in-person team building meeting.

Finding 5: There is a perceived lack of project transparency.

Actions Taken:

- Discussed expectations within the Project teams for testing, reviews and sharing information related to future tasks.
- Stored documentation within SharePoint site and shared with teams to use the same document for any updates.

Actions Planned:

Continue to use common stored SharePoint documents and collaborate for adjustments.

Finding 6: The project team require additional training regarding IT methodologies.

Actions Taken:

- Conducted training on UAT in an Agile development team.
- Worked with Project teams to train on different ceremonies for a Scrum team.

Actions Planned:

Continue to train users as needed on best practices, industry standards on testing, Agile development methodology.

Finding 7: Some IMPEI project team members lack an understanding of the project plan, direction and methodology for achieving the project goals. 78 of interviewees indicated they did not participate in a project kick-off meeting related to the overall IMPEI project.

Actions Taken:

- Facilitated a re-alignment meeting to discuss the project next steps.

Actions Planned:

Continue to discuss the project plan, activities to be performed on a regular basis with the teams.

Finding 8: Negative perceptions regarding the value of best practice standards.

Actions Taken:

- Conducted training on testing, documentation best practices.

Actions Planned:

Continue to communicate the value in using best practices for development, testing and documentation activities.

Finding 9: Some project team members lack bandwidth to complete their project work.

Actions Taken:

- Discussed the bandwidth and allocation information with leads before a project assignment begins and incorporated into the Schedule.

Actions Planned:

Continue to collaborate and discuss allocation, any issues, plan for regulation periods to accommodate tasks completion without delays.

Finding 10: Filling of vacant positions has at times been slow and has affected the project.

Actions Taken:

- OIS Technical Lead position has been filled and allocated to the project.

Actions Planned:

Continue to address any vacant positions by providing proactive notifications to the Procurements and Contracts team.

Finding 11: Documentation Management Processes

Actions Taken:

- Governance Plan is updated and approved.

Actions Planned:

Prioritize and continue to update the Management Plans.

5.3 IV&V Report

The IV&V Report for the IMPEI Project is below:

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6. Glossary of Terms and Acronyms

Term/Acronym	Definition
Acceptance Testing	A final testing stage before the program release. This kind of testing should confirm that the application is ready. Independent testing team writes test plans and test cases according to the requirements and performs testing. Acceptance Testing is a process that helps to ensure that the system meets all the requirements. It's the last stage of the development process before the release. This is not the responsibility of the ETO.
As-Is Business Processes	As-Is Business Process identifies the current state of the business within an organization.
Bug	A slang term for fault, defect, or error. Originally used to describe actual insects causing malfunctions in mechanical devices that predate computers. The International Software Testing Qualifications Board (ISTQB) glossary explains that "a human being can make an error (mistake), which produces a defect (fault, bug) in the program code, or in a document.
Business Need	A high-level business requirement that states a business objective or an impact the solution should have on its environment.
CDT	California Department of Technology
Change Control Board	A small group of stakeholders who will make decisions and determine disposition of changing requirements.
DFD	Data Flow Diagram
Data Dictionary	A model that provides a description of the data attributes and structures used in a system. This model is a central place for defining each data element and describing its data type, length, and format. Some project teams use data modeling tools that provide data dictionary capabilities.
Data Flow Diagram	Shows how information is Entrance Criteria, processed, stored, and output from a system.
Data Model	An analysis model which depicts the logical structure of data, independent of the data design or data storage mechanisms.
Deliverable	On the highest level a deliverable is the solution due to the customer at the end of a project. Also includes ongoing development of several project artifacts and solution components due by project team members to other project team members.
Entity Relationship Diagram	A visual representation of a data structure.
HCD	Housing and Community Development
ELT	Executive Leadership Team

Term/Acronym	Definition
ERD	Entity Relationship Diagram
End-to-end testing	Testing is used to test whether the performance of an application from start to finish conforms with the behavior that is expected from it. This technique can be used to identify system dependencies and confirm the integrity of data transfer across different system components remains.
Expected Results	Column in the test scenario document that shows what should happen when executing a scenario.
ISO	Information Security Office
Issue	Issues are problems, gaps, inconsistencies, or conflicts that occur during the lifecycle of a project.
PAL	Project Approval Lifecycle The California Department of Technology (Department of Technology) has adopted the Project Approval Lifecycle (PAL) to improve the quality, value, and likelihood of success for information technology (IT) projects undertaken by the State of California. The PAL is divided into four stages (Stage 1 Business Analysis, Stage 2 Alternatives Analysis, Stage 3 Solution Development and Stage 4 Project Readiness and Approval) each separated by gates of approval. Each stage consists of a set of prescribed, cross-functional, and parallel activities to develop deliverables used as the Entrance Criteria for the next stage. The gates provide a series of "go/no go" decision points that request only the necessary and known information needed to make sound decisions for that particular point in time.
Project	A temporary endeavor undertaken to create a unique product, service, or result.
Walkthrough	A type of peer review in which participants discuss requirements documentation. Used to verify how correctly the requirements have been presented.