Assessor Property Assessment System (APAS)

Project

Exhibit E

Data Cleansing Statement of Work # 3

March 12, 2020

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Definitions

Abbreviation	Meaning
ACRE	Assessor-County Clerk-Recorder-Elections
APAS	Assessor Property Assessment System
API	Application Program Interface
APN	Assessor's Parcel Number
ARB	Architecture Review Board
BFA	Business Functional Areas
BOE	Board of Equalization
CIO	Change in Ownership
CCB	Change Control Board
CAMA	Computer Assisted Mass Appraisal
COGO	Coordinate Geometry
DB	Database
DM	Document Management
DNQ	Does Not Qualify
ERD	Entity Relationship Diagram
ETL	Extract, Transform, Load
FEIN	Federal Employer Identification Number
FTP	File Transfer Protocol
HLD	High Level Design
Hi-Fi	High Fidelity
IE	Internet Explorer
ITIL	Information Technology Infrastructure Library
IV&V	Independent Verification and Validation
KT	Knowledge Transfer
LOE	Level of Effort

Lo-Fi	Low Fidelity
M&O	Maintenance and Operations
NFR	Non-Functional Requirements
PDF	Portable Document Format
PMI	Project Management Institute
POC	Proof of Concept
QA	Quality Assurance
QC	Quality Control
QM	Quality Management
RFP	Request For Proposal
RTM	Requirements Traceability Matrix
SDLC	Software Development Life Cycle
SIT	System Integration Test
SLA	Service Level Agreement
SMC	County of San Mateo
SOP	Standard Operating Procedure
SOW	Statement of Work
SRS	Software Requirements Specification
UAT	User Acceptance Testing
UI	User Interface
VPN	Virtual Private Network
W3C	World Wide Web Consortium
WBS	Work Breakdown Structure
XML	Extensible Markup Language

This Statement of Work #3 ("SOW #3") is entered into pursuant to and is a part of the Contract between the County of San Mateo, a political subdivision of the State of California (**"Customer"** or **"County"**) and Sapient Corporation, a wholly-owned subsidiary of Publicis Groupe S.A., a French holding company registered on the Euronext stock exchange, having a principal place of business at 40 Water Street, Boston, MA 02109 ("**Contractor**") effective as of December 11, 2018 (the "Agreement Resolution 076320"). All terms used in this SOW #3 and not otherwise defined herein will have the same meaning as in the Agreement Resolution 076320.

1. Objectives and Overview

The core assessment application of ACRE utilizes the secured and unsecured property assessment modules of the "EZ Access" software solution. In addition to this core application, the Division staff rely on a significant number of customized MS Excel Spreadsheets, some MS Access as well as MySQL databases and physical document workflow processes. The use of varied data sources across spreadsheets, databases, paper documents, and manual workflows has increased staff workloads, as well as increased the difficulty of training new hires to work in such a complex environment.

The goal of the APAS Data Cleansing Project is to extract, profile, cleanse and merge the data from both EZ Access (Secured and Unsecured) and the non-EZ Access data sources. The objectives of the project necessary to achieve this goal are:

- Develop data extraction, profiling, cleansing, merging strategy and roadmap
- Extract and standardize the data from all the identified legacy data sources
- Profile and assess the data to get a deeper understanding of the quality of legacy data
- Perform data cleansing and corrections to improve data accuracy
- Perform data reconciliation at all required stages to make sure data is flowing accurately between the sources, different staging databases and the final target which is the APAS production database
- Perform data merge to prepare succinct data files that contain the cleansed data in agreed upon formats which can be loaded successfully into APAS staging database for data conversion.

1.1 EZ Access Legacy System

ACRE's legacy system, referred to as "EZ Access", was developed by Hamer Enterprises with the intention of storing and processing California property assessment information. The EZ Access Legacy System is 20 years old and runs on IBM AS/400 technology. The EZ Access System has two modules: The Secured module for real property assessments and the Unsecured module for business personal property assessments as well as possessory interest assessments. The Secured and Unsecured modules are separate and distinct with different data fields and functions. On an annual basis, ACRE Staff executes manual data imports/exports to exchange information between the two modules in preparation for completing the Assessment Roll and submitting comprehensive assessment information to the Controller's Office for processing property taxes.

1.2 Non-EZ Access Systems

Due to limitations of the EZ Access System, ACRE Staff has developed workarounds that assist in the collection and calculation of data for assessment and auditing purposes. These non-EZ Access data sources are managed by individual ACRE Staff in both Real Property and Business Personal Property, and the data source formats vary from MS Excel, ASCII Text files to MySQL and MS Access databases.

In preparation for the Data Cleansing Project, the non-EZ Access data sources were reviewed by ACRE Staff. The outcome of this review process identified approx. 36 non-EZ Access data sources that will be in scope for the data cleansing project. Other data sources are out-of-scope for this cleansing project and will remain in their current state and stored in ACRE document repository for historical reference. Additional information regarding the Non-EZ Access Systems can be found in Exhibit E-1 and E-2.

All documents referenced in this SOW #3 are incorporated by reference as if fully set forth herein.

2. Project Scope

Contractor shall be responsible for developing, testing and implementing all the processes required for legacy data extraction, profiling, cleansing, and merging.

Contractor shall provide the cleansed data files in an iterative manner to ensure that the latest point-in-time data is converted and migrated to the APAS system.

Data Cleansing and Conversion Services is divided into the following steps:

Step	Data Cleansing and Conversion Activity	Responsibility
1	*Data Extraction* – Data is extracted from the legacy systems, including EZ Access and non-EZ Access data sources, based on specified selection criteria (Parcel Number, Account number etc.). The extracted legacy data needs to be standardized and loaded into a staging relational database in the data cleansing environment	*Contractor* will be responsible for legacy data extraction, standardization and load into Data Cleansing staging database.
2	*Data Profiling* – Profile and assess the key data components to identify data that will need to be cleansed and/or corrected prior to converting and migrating into the new APAS system.	*Contractor* will be responsible for profiling as well as assessing the legacy data and generating data quality reports.
3	*Data Cleansing* – Each data element is validated for acceptable data values. Exceptions to the data validation rules are reported during data cleansing process for further analysis and corrective action	*Contractor* will be responsible for cleansing of legacy data.
4	*Data Merge* – Cleansed legacy data from the different data sources are merged together to establish logical relationships between data elements based on identifying characteristics (e.g., parcel number, account number, etc.).	*Contractor* will be responsible for merging the cleansed legacy data in the data cleansing staging database. Contractor shall provide succinct data files to APAS project team. APAS project team shall support the efforts for Data Conversion and Migration by Contractor.

5	*Data Conversion* – The merged data in the data files (from the data cleansing staging database) are converted / transformed to fit into the APAS staging database tables	***Contractor (In scope for APAS)*** is responsible for design and build of any/all ETL logic required to convert the data from the data cleansing project provided data files to fit the APAS staging database tables. ***Contractor (In scope for APAS)*** is responsible for creating the APAS staging database tables, populating the APAS staging database tables based on the data files provided by the data cleansing project, and for maintaining the APAS staging database tables once the data is converted.
6	*Data Migration/Load* – Data populated onto the APAS staging database tables is loaded into the APAS database.	***Contractor (In scope for APAS)*** is responsible for migrating/loading all the data in the APAS staging database tables into the APAS database and managing/tracking the Data Conversion process and progress.
7	*Data Test* – Once the data is loaded into the APAS database, the conversion of data shall be thoroughly tested and verified as successfully converted, without discrepancy.	***Contractor (In scope for APAS)*** is responsible for testing the conversion of legacy data from the point of populating APAS staging database tables. Sapient is responsible to work with the data cleansing project team to identify any root-cause issues preventing data conversion from being fully successful and conduct any reconciliation necessary to ensure success.

8	*Data Validation –* Once data has been tested by Contractor, ACRE will perform final data validation and approval.	***ACRE*** is responsible for the final validation and approval of converted data. Contractor shall support ACRE staff by providing easy access and issue identification tools. Issues Identified will be referred to the *appropriate* Data Cleansing and Conversion activity and the corresponding vendor for correction

Contractor shall be responsible for:
- Coding all extract, transform/standardize, and load (ETL) logic using Talend Data Management Platform to move legacy data from all the identified data sources to the Data Cleansing staging database.
- To work with ACRE to identify any root-cause issues preventing data conversion from being fully successful and for conducting any reconciliation activities necessary to ensure success

County shall be responsible for:
- The final validation and approval of converted data in APAS, and Contractor will support ACRE efforts
- Making the Legacy systems available to Contractor for extracting legacy data.
- Correct any missing records in legacy Ez-Access systems if deemed appropriate by the SMEs after reviewing Data Profiling insights
- Provide direction to Contractor to perform data cleansing rules, bring data as is, or exclude the data from migration
- Assist Contractor in defining Input Data Quality Rules, which will be used for data cleansing
- Form a Data Governance Board staffed with appropriate members for EzAccess/Non-EzAccess sources, whose responsibility is to be the final authority for reviewing/approving the quality of data to be loaded in APAS
- Once a feature goes live, adhere to the Source System of record principle agreed upon by Contractor and ACRE i.e. make changes directly only to Source System of Record

2.1 Phased Implementation of Data Cleansing for APAS

The implementation of the Data cleansing project will be done in phases which are aligned to the current APAS program release plan. While the components of APAS Phases are based upon the current APAS released plan, Contractor will work with to ACRE to align and modify

as needed with any changes in the APAS release plan. This will include mutual decisions made by ACRE and Contractor during the implementation of the phases.

At a high level, each of the phases will cover the below functional capabilities for Data Cleansing.

The Contractor shall align Data cleansing phases with the APAS program. The detail as it related to the data model and cleansed data required for successful system testing and ultimately the data required for production deployment. The data cleansing project is closely aligned with phases, releases and sprints. The details of each of these Phases are covered in Exhibit E-5 Data Cleansing Project Plan.

APAS Phase	Data Cleansing Scope
Phase 1	PI and TPZ & Williamson Act (For details refer to mini project part 1 (CR-007) and Part 2 (CR-008)
Phase 2	No data sources dependent on it as it is a Foundational Phase
Phase 3	Parcel Management & CIO Data
	Secured Property Management, Appraisal and Appeals
	Secured Roll Management
Phase 4	Account Discovery, Business Property, Statement Processing, Unsecured Property Management and BPP Valuation
	Unsecured Roll Management
Phase 5	Exemptions, Decline, BPP Property Discovery
	BPP Audit, Calamities, Appeals

The implementation must meet the following conditions:
- Data extraction, profiling, cleansing and certification shall be strategically sequenced to adhere to a logical process flow. Each phase will be segmented into distinct sequential releases. Each release must group business functions in a way to logically support end user testing. The releases must be logically grouped and sequenced according to business needs. The Release Plan deliverable will define the releases for each phase.
- Ensure both legacy and non-legacy sources are synched up periodically as identified in the APAS project plan
- The County shall certify and sign off on a cleansed data before loading the data in production APAS system

2.2 Changes to the Requirements

After signoff on Input Data Quality rule for source(s) (EzAccess or Non-EzAccess), these rules shall be the basis for Data Cleansing and Data Certification. If there is a proposed addition, deletion or change to the Input Data Quality Rules after Data Certification, Contractor will review the impact (cost/effort/time/risk/resources) and make a reasonable attempt to incorporate the change. However, if the change is complex or requires allocation of large number of Contractor resources, the Change Control

procedure shall apply as outlined in Exhibit A-7 (Change Control Procedures) of Statement Of Work # 1 effective December 11, 2018, between the County and Contractor, attached as Exhibit A to the Agreement Resolution 076320 ("**SOW # 1**").

2.3 Warranty Services Requirements

The Warranty services requirements are detailed in Exhibit A-10 (Warranty Services) of SOW # 1.

2.4 Maintenance and Operations (M&O) Support Requirements

The M&O Support requirements are detailed in Exhibit A-11 (Maintenance and Operations Support Terms) of SOW # 1.

3. Scope of Services

This Section describes the scope of Services to be conducted by the Contractor and the County throughout the project life cycle.

The scope of Services details Contractor responsibilities that must be successfully fulfilled.

This section also describes the responsibilities of the County throughout the project life cycle.

Exhibit E-4 (Roles and Responsibilities Matrix) details the deliverables, activities, and services and defines the relative responsibilities for Contractor and the County. It is underscored that this must be approached as a Project that values collaboration and transparency. Therefore, virtually all Deliverables include a consult, review and approve element.

3.1 Requirements

3.1.1 Summary of Assessor Data Sources Within Scope for Data Cleansing

Data Source	Description of Data	Additional Info
EZ Access Legacy System	Real Property (Secured) and Business Personal Property (Unsecured) assessment legacy data	Please refer to Exhibit E-1 (EZ-Access Data Dictionary for Business Personal Property and Real Property)
Non-EZ Access Systems (Access DBs, MySQL DBs, Excel Files)	Additional data related to Appeals, Real Property, and Business Personal Property stored outside of EZ Access legacy system	Please refer to Exhibit E-2(Data Inventory for Non-EZ Access Data Sources) for details on non-standardized/unstructured data sources and the corresponding statistics on no. of files, data volume etc.

3.1.2 Planning Phase Requirements

Contractor shall:

- Plan and conduct Project Initiation activities including kick-off, on-boarding of resources, etc.
- Work with ACRE to validate and refine the high-level project requirements for each phase of the project.
- Develop a Project Management Plan including Communication Management Plan, Human Resources Management Plan, Risk Management Plan, Quality Control Plan, Change Control Plan, etc.
- Develop Data Extraction, Profiling, Cleansing and Merging Strategy.
- Develop Master Test Plan.
- Develop procedures for issue resolution.

- Finalize and setup the Data Cleansing Environment in Amazon Web Services (AWS), required software/tools.

3.1.3   Data Extraction, Standardization and Load Requirements

Assessor legacy data resides in two major categories of data sources:

- In the AS400 based EZ Access Legacy System, and
- In non-EZ Access data sources like unstructured, non-tabular and tabular Excel files, Access DBs and MySQL DBs.

Contractor shall:
- Configure a Data Cleansing Relational Staging Database.
  Perform a test-run using small set of data to ensure that the Data Cleansing Environment is working fine.
- Extract the pre-defined volume of data from the identified data sources
- Perform any required standardization (e.g. transformations of unstructured data to make it suitable for loading into a relational database).
- Load the data into the Data Cleansing Relational Staging Database, after applying any required data transformations to establish/maintain logical data relationships.
- Test the data extraction, standardization and load process thoroughly to make sure the requirements are met.
- Work with ACRE to facilitate User Acceptance Testing of the data extraction, transformation and load process and address the issues reported in a timely manner.
- Produce audit/reconciliation reports, review and resolve any reconciliation issues.
- Document 'Source to Target' mapping of the data elements in the Data Cleansing Staging Database, to map them back to the corresponding data elements in the legacy data source.
- Design, develop and implement the data extraction, standardization and load process in such a way that the legacy data can be extracted, standardized and loaded in an iterative manner to ensure that the latest point-in-time data is processed during data cleansing.

3.1.4   Data Profiling Requirements

Data Profiling must be performed on the assessor legacy data to gain a detailed understanding of it and to identify the datasets that need cleansing.

The main goals of this task are multi-fold, as described below:
- Profile the legacy data to Identify/Validate/Refine metadata of the legacy data, including value patterns, key candidates, foreign-key candidates, functional dependencies etc.
- Assess data quality and identify the data values that do not conform to defined standards or patterns based on the defined business/data rules.
- Analyze key data components to identify data that will need to be cleansed / corrected prior to converting and migrating it into APAS system.

Contractor shall:

- Define the approach to be used for Data Profiling.
- Work with ACRE to identify as well as document the detailed Data Profiling Requirements, including data quality assessment requirements, Business Rules, Data Rules and list of standard data values (e.g. valid list of values for various code fields) based on which data profiling and data quality assessment will be performed.
- Perform various types of analysis for data profiling, including but not limited to:
  - Completeness Analysis
    - e.g. - how often is a given attribute populated, versus blank or null?
  - Uniqueness Analysis
    - e.g. - how many unique (distinct) values are found for a given attribute across all records? Are there duplicates? Should there be duplicates?
  - Values Distribution Analysis
    - e.g. - what is the distribution of records across different values for a given attribute?
  - Range Analysis
    - e.g. - what is the minimum, maximum, average and median values found for a given attribute?
  - Pattern Analysis
    - e.g. - what formats were found for a given attribute, and what is the distribution of records across these formats?
- Identify the key data elements, the key attributes, and their relationships to other data elements that make them important (for e.g. foreign key relationships).
- Obtain metadata of the legacy data such as data type, length, discrete values, uniqueness, occurrence of null values, typical string patterns, etc.
- Generate/Update the legacy data dictionary using the metadata that has been obtained.
- Generate and provide detailed Data Profiling reports.
- Conduct assessment/analysis of existing legacy data to evaluate key areas for completeness and consistency of data, giving special attention to data areas known to be problems based on Contractor's past experiences.
- Develop, execute and test all the processes/queries required for Data Profiling, including data quality assessment
- Save the data profiling activity logs and data profiling results in relational database tables.
- Work with ACRE to facilitate User Acceptance Testing of the data profiling process and address the issues reported in a timely manner.
- Conduct data quality assessment and identify the following types of problems including, but not limited to:

  - Duplicate records for the same primary key value
  - Missing primary-foreign key relationships
  - Missing data
  - Redundant data
  - Soundex matches for the same data
  - Incorrect formatting

- Incorrect data based on a numeric range
- Incorrect data based on relationship rules
- Non-unique keys
- Incomplete data elements based on Assessor business rules, policies, and statutes
- Referential integrity violations
- Orphaned records (records that should be associated to master record(s) but are not), based on Assessor business rules, policies, and statutes
- Childless parents (records that should have related records but do not), based on Assessor business rules, policies, and statutes
- Valid codes for specific instances (only specific codes are valid for a given situation)
- Data value commonality (same code used multiple places with varying values)
- Invalid date ranges (when the dates do not conform to business or logical standards)
- Invalid/incomplete dates
- Invalid code values
- Code value outliers outside of expected values
- Code value anomalies based on Assessor business rules, policies, and statutes
- Amount totals vs. summarized detail
- Amount deltas based on Assessor business rules, policies, and statutes
- Other ad-hoc or miscellaneous problems

- Generate and provide detailed data quality reports
- Work with ACRE to analyze the data quality report and find out the root cause for data quality issues.
- Design, Develop and implement the data profiling process in such a way that the legacy data can be profiled in an iterative manner to ensure that the latest point- in-time data is processed during data cleansing.
- Define the approach as well as strategy to be used for data cleansing and remediation.

3.1.5 Data Cleansing Requirements

Based on the data quality reports produced from the Data Profiling exercise and Assessor Business / Data Rules, Contractor will cleanse the legacy data (both EZ Access data and the data from the unstructured/structured non-EZ Access files) to correct the errors as well as improve the data quality to make the legacy data ready for conversion and migration into the new APAS database.

Contractor shall:

- Work with ACRE to identify as well as document the detailed Data Cleansing Requirements, Business Rules, Data Rules and list of standard data values based on the findings from Data Profiling.
- Design Data Cleansing processes/queries/scripts to address the type of problems including, but not limited to:
  - Mailing Addresses issues
  - Discrepancies in standard Code values

- Errors based on acceptable Range of Values
- Null Values
- Leading & Trailing blank spaces
- Invalid characters in Character fields
- Invalid numbers in Number Field
- Invalid dates in Dates Fields
- Broken data element relationships (referential integrity etc.)
- Develop and test all the processes/queries/scripts required for Data Cleansing.
- Execute Data Cleansing process to correct data and improve data quality.
- Save the cleansed data in Data Cleansing staging database tables.
- Produce the updated Data Dictionary of the Data Cleansing database.
- Save the data cleansing activity logs and error/exception reports in Data Cleansing staging database tables.
- Produce data cleansing results reports.
- Produce error/exception reports for the business SMEs.
- Produce data cleansing reconciliation reports and resolve any reconciliation
- issues.
- Provide a mechanism/interface/tool for the ACRE SMEs to review and correct the data values, to address the data problems (including missing data) listed in the data exception reports.
- Work with ACRE to review the error/exception reports and take any necessary actions to correct the data and improve data quality.
- Take any necessary action to improve the results in the next iteration of data cleansing.
- Update the documentation on 'Source to Target' mapping of the data elements to include any new data elements/fields added as a result of data cleansing.
- Design, Develop and implement the data cleansing process in such a way that the legacy data can be cleansed in an iterative manner to ensure that the latest point-in-time data is processed during data cleansing.

3.2.6 Data Merge Requirements

The main goal of this task is to produce succinct data files that contain cleansed data, which will be loaded into APAS staging tables to perform data transformation, data conversion and migration.

The cleansed data in these succinct data files needs to be denormalized in such a way that the proper data relationships between data elements are established/maintained, as per the agreed upon data model between ACRE and Contractor.

Contractor shall:

- Work with ACRE to identify the detailed data merge requirements.
- Develop, Execute and Test data merge process.
- Work with ACRE to facilitate User Acceptance Testing of the data merge process and address the issues reported in a timely manner.

- Perform any logical transformation of data/denormalization of data to a level that is required to establish proper data relationships between data elements, as per the agreed-upon requirements and data model.
- Generate succinct data files for APAS staging tables in the agreed-upon format that is compatible to the APAS data model.
- Design, develop and implement the data merge process in such a way that the data files can be passed on to the APAS staging tables in an iterative manner to ensure that the latest point-in-time data is converted and migrated to the new APAS system.

3.2.7 Data Privacy and Security Requirements

Contractor will agree to comply with state, federal, and local confidentiality and information disclosure laws, rules and regulations applicable to Services provided by Contractor under this SOW # 3.

County shall, in relation to personal information that it collects, stores, uses, handles, discloses, or processes in connection with this SOW # 3:
- process personal information in accordance with data protection laws;
- ensure that its instructions to Contractor for processing personal information comply with data protection laws;
- ensure that the personal information has been collected in accordance with data protection laws, including that it has obtained all required and legally enforceable consents and has the right to use the personal information for the purposes set out in in this SOW # 3, and that the processing of personal information for those purposes is lawful under applicable data protection laws; and
- County represents that it has obtained and provided data to Sapient consistent with its obligations under the law to maintain the security and privacy of the personal information.

3.2 Architecture & Design

Contractor must develop an architecture as required to meet requirements of data cleansing. All key decisions regarding the Solution architecture shall be made by the Architecture Review Board (ARB). The ARB shall review all technical aspects of the Project and provide recommendation to the respective teams.

Contractor shall also review all proposed changes or variances to the architecture to assess both the viability of the change as well as the consistency with the architecture solution. Any instances where Contractor is proposing development/implementation that varies from the agreed upon Solution architecture, must be brought to the ARB for review and approval.

3.3 Testing and Data Quality Assurance

Contractor shall create the Master Testing (Data Quality Assurance) Strategy and Plan to ensure that major data quality assurance activities required to be performed are identified and a plan has been developed to carry out these activities in an organized manner. A separate and complete set of testing shall be required for each applicable task. The testing functions

of the Project shall be iterative and span the entire length of the Project. Contractor shall employ a robust test methodology based on industry standards.
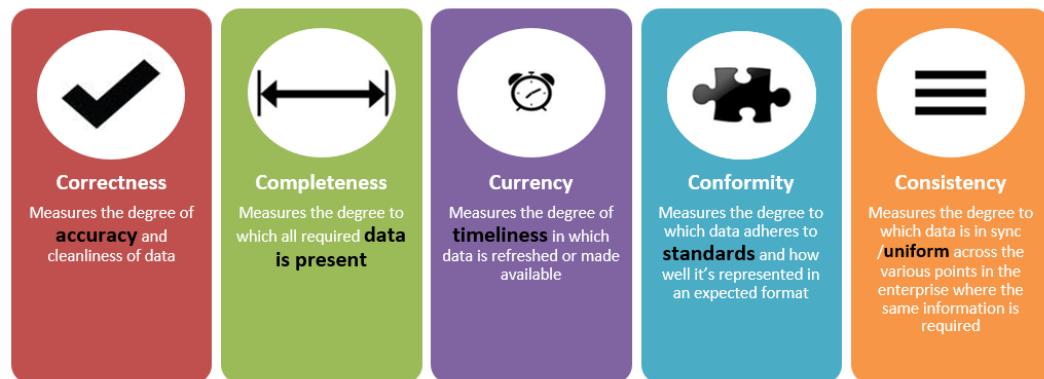
Contractor shall be responsible for providing a self-served user interface for validating and verifying outcome of data cleaning and data quality measures. This UI shall have all features for viewing Data Catalog, Dashboard to view testing results of cleansing iterations, Dev to QA, QA to UAT and UAT to PROD migration of cleans data. For issues found by ACRE staff in QA and UAT. Contractor shall either utilize a vendor's product approved by ACRE to support the testing methodology or Contractor's existing requirements management tool.

Contractor shall utilize a software-based defect tracking system capable of providing an acceptable level of detail and reporting, as agreed upon with ACRE.

Contractor shall provide the Master Testing Strategy and Plan (Test Plan), which shall, at a minimum, include:

- The test methodology to be employed for data quality assurance

  Through experience, Sapient has simplified these data quality dimensions into 5 areas, that are easy to measure and also a helpful reference when engaging various departments in their support for improving data quality.

Correctness	Completeness	Currency	Conformity	Consistency
Measures the degree of **accuracy** and cleanliness of data	Measures the degree to which all required **data is present**	Measures the degree of **timeliness** in which data is refreshed or made available	Measures the degree to which data adheres to **standards** and how well it's represented in an expected format	Measures the degree to which data is in sync **/uniform** across the various points in the enterprise where the same information is required

- The automated method of data integration between all environments with data
- Identification of the software-based tracking system that will be employed, if any
- Identified strategies for each type/level of Project Testing listed below, for Data Extraction, Data Profiling, Data Cleansing and Data Merging tasks:
  - Cleansing iterations and profiling data quality in Development
  - Data Certification Criteria for Validation, UAT and PROD
  - User Acceptance Testing
- A detailed plan to implement the test strategies identified above, including a detailed schedule for each of the activities to be completed during the testing.
- Activities in the Test Plan shall include at a minimum:
  - Description of the Test and Objectives
  - Entrance Criteria for the Test

- Exit Criteria for the Test
- Key milestones associated with each Test, including:
  - Data Quality rules Approval
  - Cleansing Start and End dates
  - Development Freeze Date(s)
  - Required Approval Dates for Test Cases, Entrance and Exit Criteria, etc.
  - • Data Profiling Results Review Meeting Completion
  - Go/No-Go Decision

3.4 Environment Management

Contractor shall be responsible for maintenance and operations of all APAS Solution functionality developed in pre-production environments such as development, testing, training and staging.

Contractor has provided an Environment Management Plan in attachment 7- Talend Environment Management plan which details the activities involved in the set-up, management and maintenance of the various production and pre-production environments required for Data Cleansing. The Environment Management Plan identifies the methods and tools used to automate, monitor, and manage the various environments to ensure the agreed upon availability. The plan includes:

- Identification of all environments required for the project;
- Schedule for setting up each identified environment;
- Strategy for monitoring and managing all the environments;
- Plan for resolving environment defects; and
- Strategy for upgrade and maintenance of all the environments.

3.5 Project/Program Management

Contractor shall follow the same methodology and plan as for APAS program as stated in Section. 3.1.8 Project/Program Management of Exhibit – A Statement of Work #1.

3.6 Proof of Concept (PoC)

During the implementation phase and, the County and Contractor shall identify risks and agree to the appropriate PoC(s) that need to be fulfilled to mitigate those risks and effectively illustrate that the proposed design and/or recommended technology tool/app that will achieve the desired results.

3.7 Hosting

All environments necessary to develop, implement and support the Data cleansing will be hosted on AWS Cloud.

3.8 Technology

Contractor will use Talend as a standard data profiling, data quality engine which is part of APAS data migration. Along with Talend in order to process some of the unique profiling

attributes that are not directly available in Talend we may have to write custom code using a county approved scripting language e.g. Python.

Tool and Technologies

Tool	Purpose
Talend Data Management Platform	• Profiling data • Load Cleansed Data into APAS Staging area • Load Cleansed Data from APAS Staging area to Salesforce
Amazon Web Services (AWS)	• AWS will be used for hosting Talend and APAS Staging Database • RDS/MySQL database on AWS will be used for storing cleansed data • MySQL Workbench or any other SQL client will be used by ACRE staff for viewing the data in MySQL tables • AWS Workspace will be used as end user computing solution (virtual desktop)
JIRA	• Project Planning and Management
Jenkins	• Open Source Automation Server for Build and Release management • In-built features for Continuous Integration and Deployment

3.9 Training

Training is a critical aspect of APAS Project implementation. A Training Plan will be developed during the Build stage (ValuePath Methodology) of the project. Contractor shall work with the County throughout the project to determine the training needs, what type of curriculum is the right fit for County user needs, define the curriculum outline, as well as monitor user acceptance testing activities to learn about potential hurdles that will need to be overcome. Contractor must develop the Education and Curriculum Strategy, End-User and

Admin Training Curriculum, Train-the-Trainer Curriculum, Training Manuals, Guides and Materials as per the Training Plan.

3.10   Knowledge Transfer

Knowledge Transfer (KT) is an important element of planning and project management to ensure that APAS Solution developed by Contractor is transferred to the County as required. Contractor Knowledge Transfer plan must identify the specific roles that would be required to support and maintain the system.

The Contractor Project Manager will be responsible for creating the KT plan and for ascertaining the level of support the County will require to provide support, maintenance and enhancements to the system. This information will be necessary to determine the specific skill sets, time commitment and cost to enable knowledge transfer to the appropriate County personnel.

Once the plan has been established, the following actions and meetings will be established to ensure that knowledge is adequately transferred to County Personnel:
- Technical knowledge transfer will be done throughout the project as part of the design review process as well as during admin training.
- County APAS Program Manager and Contractor Project/Program Manager will jointly determine a schedule to meet semi-weekly to facilitate technical KT sessions.
- Contractor technical staff shall do a comprehensive technical review of the code, architecture, configuration with County IT resources.
- Contractor shall conduct a basic training/KT for the designated County system administrator (Data DSA) covering key functions such as adding new users, more in-depth report generation, and changing security profiles.
- Contractor shall conduct a KT session focused on reporting and dashboards

3.11   Backup and Restore

Contractor shall perform Backup and Restore functions for Development and production environments on AWS at the appropriate frequency agreed upon with County.

3.12   Disaster Recovery and Business Continuity

Contractor shall implement the Disaster Recovery and Business Continuity (DR&BC) as per Attachment – 1 (Contractor Disaster Recovery and Business Continuity Plan).

3.13   Services in scope for County

While the following Project critical Deliverables are the primary responsibility of the County, Contractor shall be responsible for reviewing the County Deliverables for consistency with the solution design, the database design, the test plan, and the implementation strategy. Any conflicts or questions regarding these County Deliverables shall be raised in accordance with the APAS Project Governance Plan.

County team is primarily responsible for certain tasks of the data conversion process as described below, and the Contractor shall support the County team efforts:
- Making the legacy systems available for data conversion related tasks;

- Maintenance of the data in the legacy systems;
- Extraction of legacy data based on specified criteria;
- Data validation within the APAS test environment prior to Contractor loading data into the APAS production environment.
- Final data validation and approval of converted data within the APAS production environment.

3.13.1   User Acceptance Testing

County team is responsible for creating User Acceptance Test (UAT) scenarios that reflect the intended business use of the data to certify it. These UAT scenarios must rigorously test the APAS Solution against the in-scope requirements in a simulated business environment. Contractor shall provide resources to support the County during UAT and resolve any bugs reported during UAT prior to final deployment to production. Additionally, Contractor will provide UAT test templates for County staff to prepare the UAT scenarios.

## 3.14   Additions to Contractor Scope of Services

Should the County determine that the APAS Project requires an expansion to the Contractor scope of Services such that Contractor and County agree that the expansion should be priced by the Contractor in accordance with the rate card presented in Exhibit B-3 (Rate Card for Additional Services).

4. Project Execution Approach and Deliverables

Contractor shall follow the below iterative approach for data cleansing. Each Data source shall go through 3-4 Data cleansing Iterations. Each Iteration may include smaller cycles of data profiling and transformation.

"Cycle" is generally used to refer to completing a process, a process step, or a particular task. An "iteration" has a more specific meaning to refer to a Cleansing iteration in an incremental approach. In ValuePath, a sprint is equivalent to an iteration. An iteration would refer to a sprint and "cycle" would refer to an individual task or story. Naturally, an iteration would consist of multiple tasks or stories and each task or story would have a cycle time for completion.


Iterative Process Driven Approach
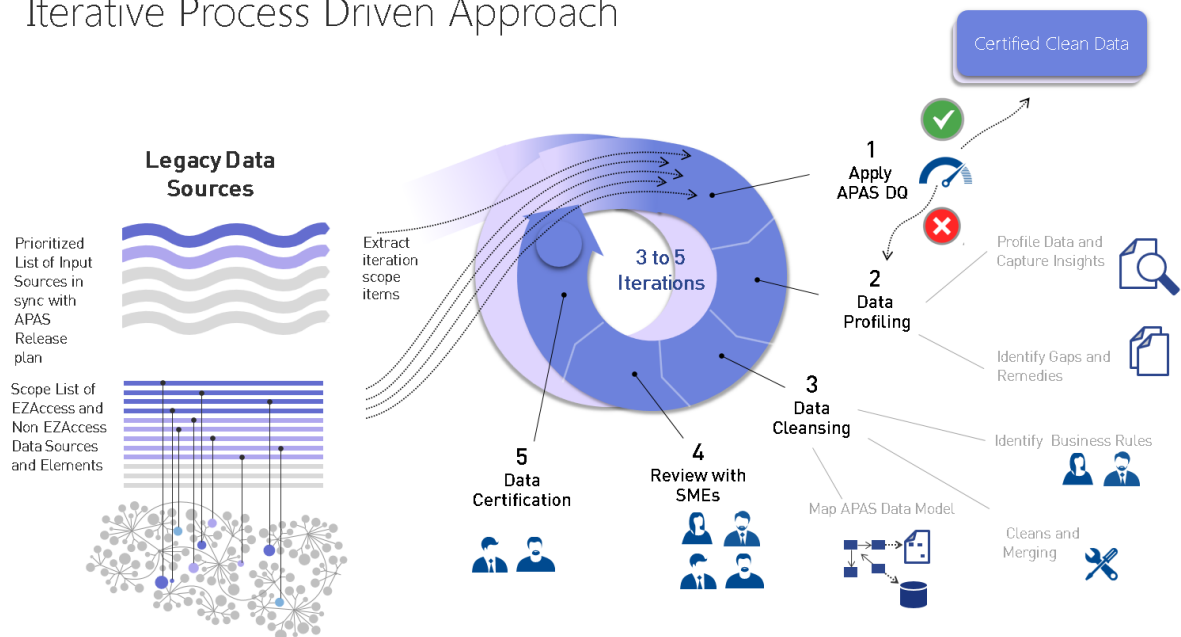
4.1 Data Cleansing Approach

- Prepare a list of Source System
- Prioritize Source System to synch up with APAS Release Plan
- For each System (in order of prioritization), Apply following iterative approach
  - Document Data Glossary: Identify business purpose of each data element in the source. Identify the mapping with corresponding APAS element in APAS
  - Identify the type of mapping
    - 1:1 mapping e.g. APN#
    - Needs transformation
    - Needs merging e.g. components of Address like Street, ZIP code, Direction
    - Needs splitting e.g. First Name & Last Name in a single field
    - Redundant/Obsolete/Trivial mapping (ROT) e.g. internal EZ-Access status codes
  - Identify Referential Integrity for e.g. Key field, Non-Key field

- Define Data Quality Rules
  - Identify Data Quality rule for the element
  - Identify Constraints e.g. Null, NOT Null, Alphanumeric, Ranges
- Extract the data from the source
- Profile the Data
- Analyze the Profiled data
  - Review the Profiling insights with Business SMEs
- Compile a list of data fields breaching Data Quality standards
- Prepare rules to mitigate the breach
- Apply Data Correction Rules
- Repeat the iterative process as needed (Note: At least 3 and maximum 4 iterations per source)
- Obtain Data Certification
- Load Cleansed data into Salesforce
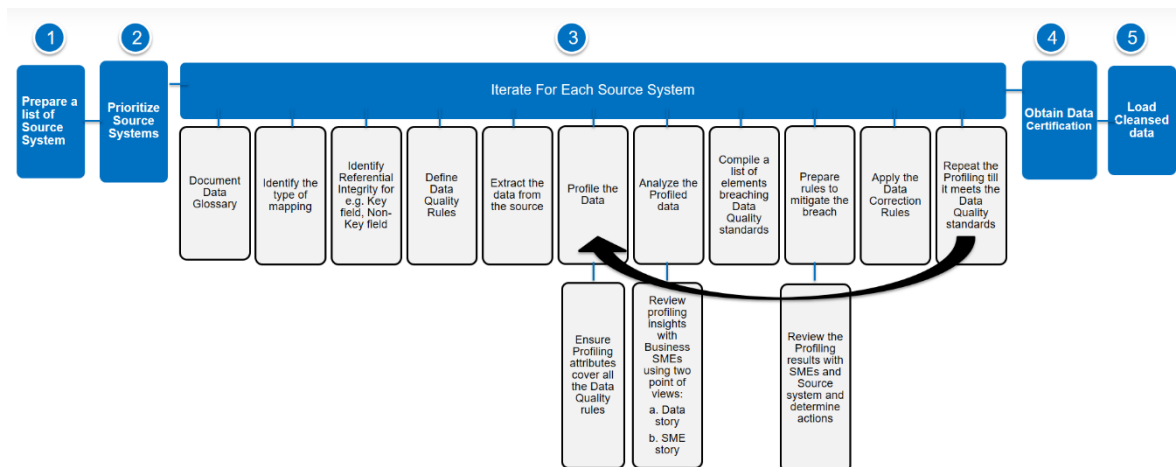
The Project will be executed using a Phased Implementation Approach as detailed in Exhibit E-5 Project Plan.

Contractor shall leverage the existing APAS JIRA project management tool and practices for consistency and efficiency. This approach will provide one view to the project tasks, effort, owners, timeline, and dependencies.

The Proposed Work Plan/Work Breakdown Structure (WBS) is listed in the tables below which includes dependencies with the APAS project:

4.2 APAS Phase 1 and Dependent Data Sources

Phase1 Releases	Capabilities (requiring Data Cleansing)	Dependent Data Sources	Deliverables
1.1	• Building Permits	• South tech building permit system (building permits - electronic files) (RP007) • Secured EZ Access (parcel and situs)	Cleansed Data certified by Governance Body (max. 5 cleansing iterations)
1.2	• Aircraft valuation • Mills Act • Disabled Veteran Exemption	• The mills act inventory excel sheet (RP017) • County airports: fixed based operators (FBO) list (BP005) • Secured EZ Access (parcel)	Cleansed Data certified by Governance Body
1.3	• PI • TPZ & Williamson Act	• Non-SFIA possessory interest annual usage report & supplemental report (RP012) • Non-SFIA Possessory Interest Agency Contact List (RP011) • Non-SFIA possessory interest leasehold structures and fixtures file (RP013) • AG access database (RP014) • TPZ access database (RP016) • SFIA possessory interest master sheet – concession (RP020) • SFIA possessory interest master sheet – aviation (RP021) • SFIA Leasehold Improvements Sheet (RP022) • Landed-weight ranking report (RP024) • Landing rights pi assessment worksheet (RP025) • Comcast report (RP026)	Cleansed Data certified by Governance Body

		- PI depreciation factor table - excel sheet (RP052) - FSZ excel spreadsheet (RP053) - PI worksheet (BP023)	

4.3 APAS Phase 2 and Dependent Data Sources

There are no dependencies between the APAS project and Data Cleansing project for this phase.

4.4 APAS Phase 3 and Dependent Data Sources

Phase 3 Releases	Capabilities (requiring Data Cleansing)	Dependent Data Sources	Deliverables
3.1	• Parcel Management • CIO	• Secured EZ Access • Legal Long Description from Recorded Docs (PM011) • List of new Situs Addresses from City/County Building Department (PM001) • APAS (reconciliation)	Cleansed Data certified by Governance Body
3.2	• Secured Property Management • Appraisal •	• Secured EZ Access • Cal Water Allocations Per Water Plant (RP018) • Mine & Mineral Accounts (RP019) • Residential Land Sales Spreadsheet (RP028) • Commercial Properties Leasing Database (RP039) •	Cleansed Data certified by Governance Body
3.3	• Secured Roll Management	• Secured EZ Access	

4.5 APAS Phase 4 and Dependent Data Sources

4.1	• Account Discovery • Business Property Statement Processing • Unsecured Property Management • BPP Valuation	• Non Secured EZ Access • Annual Trend Files of Unsecured Data in As400 System (BP003) • Harbor Masters Contact List (BP006) • Boat Berth Rate (BP013) • Airline Fleet Valuation Spreadsheet (BP014)	Cleansed Data certified by Governance Body

Release	Capabilities (requiring Data Cleansing)	Source	Deliverables
		• Rotables Valuation Spreadsheet (For United Airlines) (BP015) • Leasing Email Database List (BP026) • Personal Property Equipment Life Master File ("Quick Reference Guide") (BP028)	
4.2	• Unsecured Roll Management	• Non Secured EZ Access	

4.6 APAS Phase 5 and Dependent Data Sources

Release	Capabilities (requiring Data Cleansing)	Source	Deliverables
5.1	• Exemptions • Decline • BPP Property Discovery	• Declines MySQL Database (RP005) • Standard Industrial Classification (SIC) Code Master File (BP001) • Welfare Exemption Access DB (EX010)	Cleansed Data certified by Governance Body
5.2	• BPP Audit • Calamities • Appeals	• Audit List (BP024) • Audit Program [Excel Based Macro File] (BP025) • Appeals Management Portal MySQL Database (AP003)	Cleansed Data certified by Governance Body

5. Project Schedule

Data Cleansing Project is expected to be completed in March 2022, assuming a project start in April 2020. These dates reflect the end of warranty period 90 days post completion of the project and marks the completion of this project (March 2022).

A high-level timeline of approximate activity start and end dates as well as a detailed Project Plan is included in Exhibit E- 5 (Data Cleansing Project Plan).

The Data Governance Board will make a determination on when the data cleansed and converted is certified for APAS. UAT Testing. However, further data cleansing could likely be necessary for the UAT and Production.

6. Measures, Metrics and Reporting

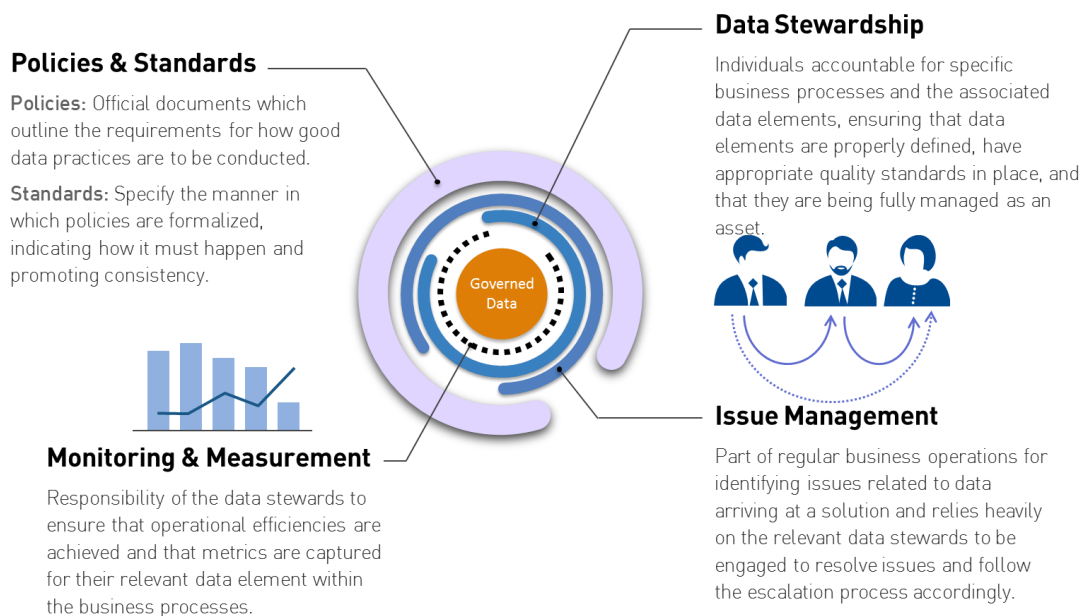Contractor and County shall use procedures defined in Section 6 of Exhibit A – Statement of Work #1.

7. Governance Process

Contractor and County shall use procedures defined in Section 7 of Exhibit A – Statement of Work #1.

7.1 Data Governance Board

In addition to the set governance procedures for APAS program a Data Governance Board (DGB) will be established that will be responsible for defining data quality standards and policies. This Data Governance Board will govern the Data Cleansing project and certify data.

- The purpose of governing data is to ensure High Quality, Consistency, Completeness, Security and Compliance. It requires a balance of collaboration between multiple stakeholders and consumers of data.

- All the artifacts, tools and processes that are put in place are enablers to ensure that for the relevant data, all stakeholders have trust in the data and the data can satisfy both business, technical, security and compliance drivers.

- To ensure that the right balance of process, tools and requirements are in place, a pragmatic and agile execution methodology is required.

Policies & Standards

Policies: Official documents which outline the requirements for how good data practices are to be conducted.

Standards: Specify the manner in which policies are formalized, indicating how it must happen and promoting consistency.

Data Stewardship

Individuals accountable for specific business processes and the associated data elements, ensuring that data elements are properly defined, have appropriate quality standards in place, and that they are being fully managed as an asset.

Governed Data

Monitoring & Measurement

Responsibility of the data stewards to ensure that operational efficiencies are achieved and that metrics are captured for their relevant data element within the business processes.

Issue Management

Part of regular business operations for identifying issues related to data arriving at a solution and relies heavily on the relevant data stewards to be engaged to resolve issues and follow the escalation process accordingly.

8. **Management Approach**

   Contractor and County shall use procedures defined in Section 8 of Exhibit A – Statement of Work #1.

9. **Project Documentation and Repository**

   Contractor and County shall use procedures defined in Section 9 of Exhibit A – Statement of Work #1.

10. **Quality Management**

    Contractor and County shall use procedures defined in Section 10 of Exhibit A – Statement of Work #1.
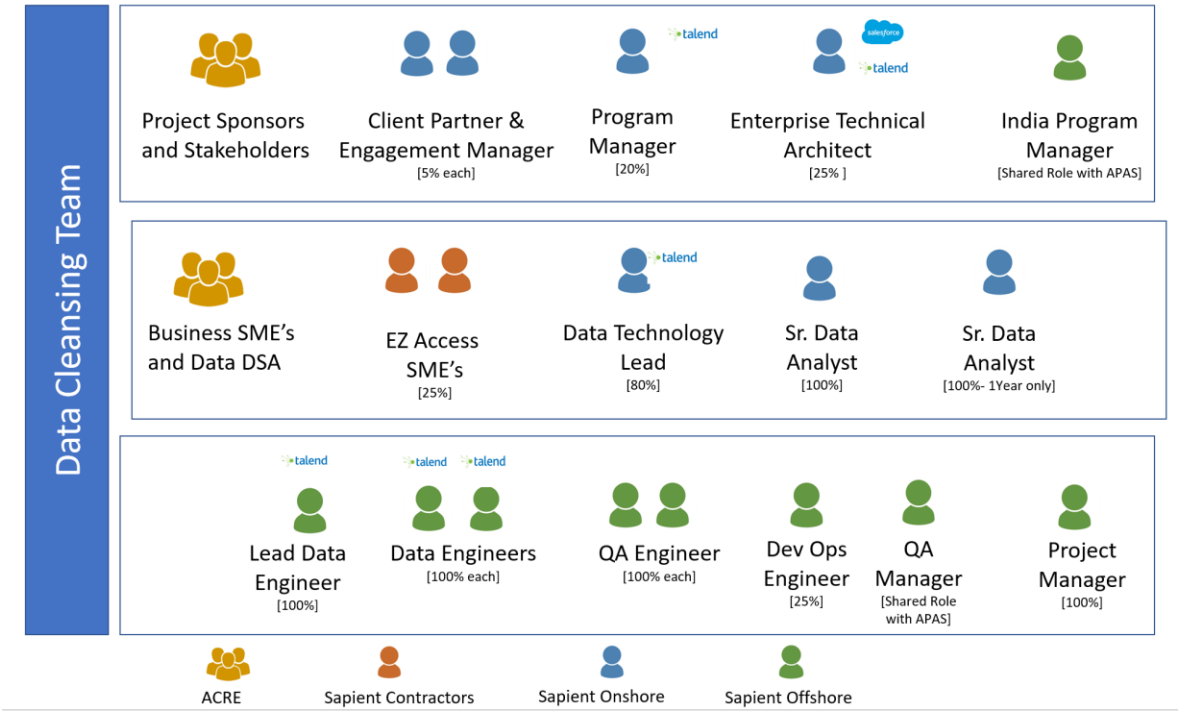
11. **Review of Deliverables**

    Contractor and County shall use procedures defined in Section 11 of Exhibit A – Statement of Work #1.
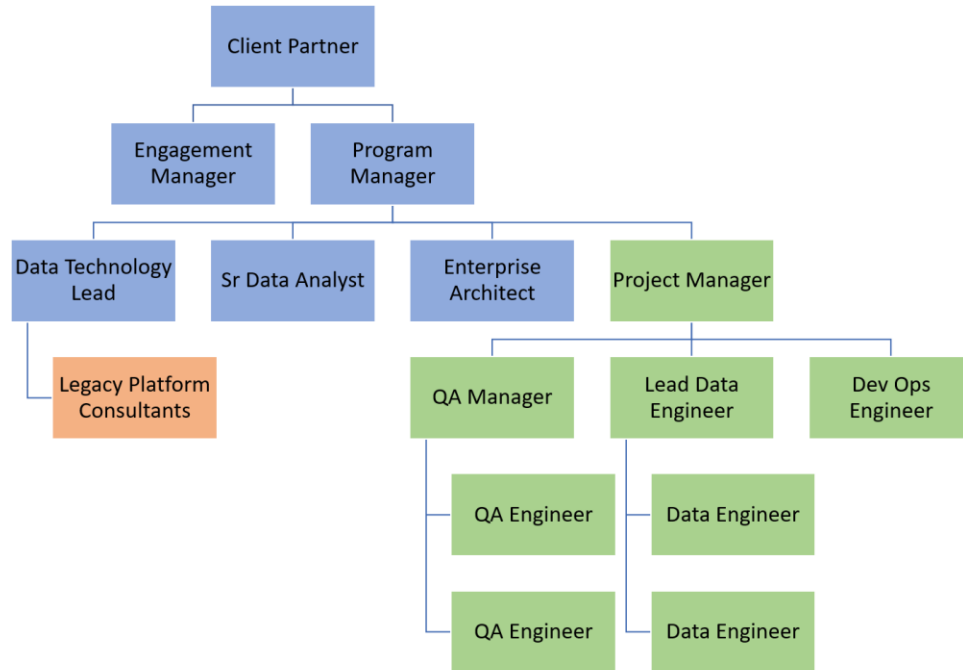
12. Project Team Structure

12.1   Contractor Team Structure

Contractor Team structure is shown below:

The organization structure of the team is depicted below:

12.2   Estimated Project Staffing

The table below provides an estimate of the project resources required by County and Contractor.

12.2.1   Key Positions

Contractor and County will use procedures defined in Section 12.3 of Exhibit A – Statement of Work #1

The key named Personnel are:
- Client Partner – Aseem Gupta
- Engagement Manager - Brian Henning
- Program Manager – Mahesh Naik
- Data Technology Lead – Neelesh Vilekar

The following table lists high level Contractor roles and responsibilities:

Role	Team Member	%Commitment to Role	% Onsite	Roles & Responsibilities
Client Partner	Aseem Gupta	5%	As needed	- Escalation of critical and governance issues requiring immediate

				- senior management intervention of County and Contractor; - Ensure the appropriate roles and resources are allocated to the team; - Represent Contractor leadership during Steering Committee meetings.
Engagement Manager	Brian Henning	5%	As Needed	- Primary point of contact for the relationship between the County & Sapient; - Ensure County's expectations are being met or exceeded; - Represent Sapient leadership during Steering Committee meetings; - Provide contract management support; - Escalation point for risks, issues, and support.
Program Manager	Mahesh Naik	[20%]-Shared Role with APAS	80%	- Establish and fulfill program governance; - Define Strategy and Approach for Technical Delivery; - Ensure agreed-to scope, timeline, and resource needs are being properly fulfilled; - Provide guidance on the completion of deliverables; - Provide contract management support; - Evaluate and ensure the appropriate levels of throughput from the team;

				- Escalation of project issues including delays in issue resolution, response and quality of deliverables, which may impacts other interfacing groups; - Generate and maintain data architecture/model that fulfills business functions and capabilities; - Ensure team understands and fulfills data architecture/model.
Offshore Program Manager	Ankur Goel	Shared Role with APAS	NA	- Management and oversight of offshore team; - Coordinate offshore project activities between Data Cleansing and APAS Project.
Data Technology Lead	Neelesh Vilekar	Shared Role with APAS	80%	- Design, Build, and Implement the Data Cleansing / Data quality solution; - Analyze and document the data sources, identify data stewards, data lineage, data quality and cleansing rules; - Design, Build and Implement framework for profiling, cleansing, and migrating the data to APAS; - Lead and guide onshore and offshore team members to ensure high quality and timeliness of deliverables;

				- Work closely with APAS technical team on data mapping and migration; - Ownership of overall Data Quality and Data Reconciliation; - Work with EzAccess SMEs; - Work with ACRE DSAs and SMEs.
Enterprise Technical Architect	Honey Bhatnagar and Jorge Torre	[10% each]- Shared Role with APAS	80%	- Provide inputs for prioritization of data sources for cleansing aligned to APAS release plan; - Ownership for Synching APAS Data Model with the attributes in the Cleansed data; - Defining and Applying Input Data Quality rules before loading the cleansed data to APAS; - Responsible for executing the migration of cleansed data to APAS.
Sr. Data Analyst 2 [1st - 2year 2nd – 1year]	TBC	100%	80%	- Analyze and document data sources, identify data stewards, data lineage, data quality and cleansing rules; - Work closely with Data Analyst and APAS technical team; - Conduct business analysis sessions, capture data flows, create a data dictionary with detailed business description of the taxonomy;

				- Identify and resolve potential gaps between source and target data models along with reconciliation strategies; - Gather business insights from the profiled data and review with ACRE SMEs for potential solutions; - Ownership of overall business analysis, business rules, cleansing rules, and data mapping; - Work with EzAccess SMEs; - Work with ACRE DSAs and SMEs.
Offshore Project Manager	TBC	100%	NA	- Management and oversight of Data Cleansingteam; - Coordinate Data Cleansing project activities, milestones, and deliverables; - Tracking of project issues related to milestones, deliverables, resources, quality of services, process deviations, non-compliance, improvements.
Data Engineers [2]	TBC	100%	NA	- Build, Test, and Implement all technical processes for data cleansing using prescribed tools; - Conduct all POCs as directed; - Execute each iteration of overall cleansing

Key Role	Team Member	% Commitment to Role		Roles & Responsibilities
				process and generate reports; - Build and Test cleansing and reconciliation framework.
QA Lead	TBC	Shared Role with APAS	NA	- Collaborate with ACRE to define the QA strategy for Extraction, Data Quality, Reconciliation, and Loading data into APAS; - Collaborate with ACRE to define Test defect handling; - Ownership of Data Certification rules and criteria.
QA Engineers [2]	TBC	100%	NA	- Write test cases and acceptance criteria in line with QA strategy; - Execute test cases, capture results, and report issues.
Dev Ops Engineer	TBC	25%	NA	- Deploy and maintain CI/CD pipelines across multiple environments; - Build DDL scripts; - Work closely with Technology Lead; - Iterate on best practices to increase the quality & velocity of deployments.

The following table lists high level roles and responsibilities of County Key Personnel assigned for APAS.

Key Role	Team Member	% Commitment to Role	Roles & Responsibilities

ACRE IT Director	Randy Mellin	As Needed	- Manage all Organizational Change Management activities; - APAS project budget oversight; - Inter Departmental Project Scope Management.
Deputy Assessor	Alex Tharayil	As Needed	- APAS project business sponsor; - Review and accept APAS solution.
APAS Program Manager	Paul Paulose	20%	- Overall program manager responsible for managing the project to completion; - Focal point of communication between Contractor team and County team; - Work with the Contractor Project/Program Manager to develop, manage and maintain the project plan; - Identify and manage risks, issues impacting the project.
Data Conversion SME Lead (Product Owner)	TBD	15-25%	- Managing APAS Appraiser Services SME staff working on Data Conversion; - Support User Acceptance Testing; - Facilitate and own decisions on the validation of data and decisions on sources for cleansing.
Business Staff	TBD	10-20% (for each functional area during analysis review and certification)	- Participate in the requirements definition process, data cleansing, QA, testing and training efforts; - Review APAS functional and general requirements; - User Acceptance testing.
Data Conversion Project	ACRE SME Project Manager	1.5 FTE	- Manage a cross-functional team of project, technical and business personnel from all County stakeholder groups

Manager/ SMEs			- Lead County stakeholder quality assurance and quality control activities.
Department Systems Analyst	ACRE DSA	1 FTE	- Participate in the detailed business and technical requirements, architecture, design, data modeling, QA, testing and training efforts; - Review APAS functional, general and technical requirements - Support UAT.

12.2.2   Contractor Personnel

Contractor and County shall use procedures defined in Section 12.4 of Exhibit A – Statement of Work #1

The table below summarizes the average experiences of the proposed offshore and onshore resources for APAS:

Role	Years of Experience	Location
Enterprise Architect	10-15 Years	Onshore/Offshore
Program Manager	10-15 Years	Onshore/Offshore
Sr Data Technology Lead	10-15 Years	Onshore
Leads – Data Analyst	8-15 Years	Onshore
Data Engineers	3-5 Years	Offshore
QA Engineers	2-5 Years	Offshore

The Data Engineers on the team will be Talend Certified.

12.2.3   Subcontractors

Contractor and County shall use procedures defined in Section 12.5 of Exhibit A – Statement of Work #1

13. Location of Services

Services will be provided at the County facilities at 555 County Center, Redwood City, California and at 400 Convention Way, Redwood City, CA, 94063 and Contractor facilities at the location(s) identified in Exhibit A-13 (Location of Services).

Contractor will not initiate a change to any Contractor Location from which it provides the Services as specified in Exhibit A-13 (Location of Services) of SOW # 1, without County's prior agreement pursuant to the Change Control Procedures.

13.1   Services to be performed at the Onshore and Offshore

Contractor onsite staff shall be authorized to make decisions on the day-to-day operations of the Project. The list below provides more detail on the responsibilities split amongst the onshore and offshore resources.

- Onshore: Planning sessions, data analysis sessions, business rules definition/review for data issues, design workshops, design review, coordination of APAS UAT, Data Certification ongoing program and project management.

- Offshore: Project management support, execution of data extraction, profiling, analytical insights from profiling, build data cleansing engine, creation and maintenance of business rules repository, building dev ops infrastructure for deployment, execution of profiling Iterations, creation and maintenance of staging data model, migration of cleansed data to APAS, quality control activities.

14. Project Assumptions

14.1   General Project Assumptions

This SOW #3 and Contractor's estimates are based on the following list of key assumptions. Deviations that arise during the project will be managed through Exhibit A-7 (Change Control Procedures), and may result in adjustments to the Project Scope, Estimated Schedule, Charges, and other terms. If an assumption deviation is not resolved through the documented Change Control Procedure within 30 days, then the issue will be resolved in accordance with the documented Escalation Procedure outlined in this SOW #1.

- Native Talend Data Management Platform functionality will be leveraged and will be the default approach to meet requirements. Any exception will have to be approved by the County.
- The County will be responsible for providing the contractor the necessary software license keys for installation purposes, along with access to necessary software vendor Support documentation/website
- Any third-party software deemed required by the County will be purchased directly by the County

14.2   Contract Assumptions:

- The County will have obtained all necessary software licenses prior to the start of the project.
- The cost of printing and shipping training, support and user guides (if applicable) is the responsibility of the County.
- As it relates to printing, printer hardware, and setup, these tasks are expected to be managed by the County.
- Contractor is not responsible for modifying systems external to the APAS solution based on any changes to applicable laws, regulations, and statutes.

Sensitive Data will be masked before loading Dev/QA non-prod environments. Scrubbing framework will be in place to deal with the sensitive data elements. See the diagram below. The parties hereby agree that, other than as specifically set forth in the following sentence, County will not transfer or disclose to Contractor any information which by itself or in combination with other information can identify an individual in connection with this SOW # 3. Contractor will only have access to:

- Name (Owner Name, Care Of)
- Mailing Address/Residential Address/Business Location (Street, City, State, ZIP Country)
- SSN or Fed ID Flag
- Telephone
- Fax and Email
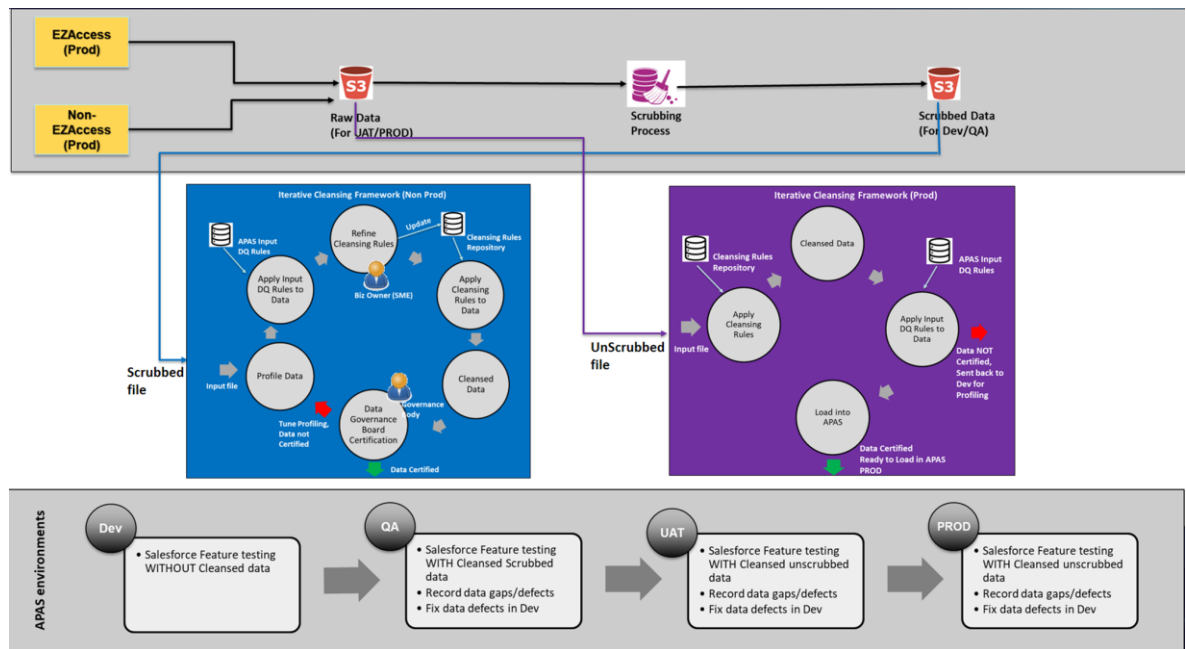
14.3 Technical Assumptions

- County will provide direct access to ACRE applications via a VPN Tunnel behind County firewall. (See Appendix E1 - List of Apps requiring VPN Tunnel)
- County shall provide designated Contractor resource the right level of access to perform their job
- SharePoint will be used for the purposes of project collaboration only. There is no integration needed between APAS and SharePoint. FileNet will continue to be used as the document management system for APAS.
- There is no integration needed between APAS and SharePoint.
- AWS Government cloud will be used for hosting Talend and other services e.g. DevOps
- County will engage third party member Vendors as requested by Sapient during functionality built out e.g. FileNet
- Contractor will work directly with Hamer and County for setting up VPN Tunnel with their Data Center, where EzAccess (Non-Prod) is hosted.
- Any changes to Data Structures to Ez-Access or Non-EzAccess would be explicitly communicated/shared by the County with the Contractor to allow for assessment of impacts to the proposed solution.
- DevOps framework adopted by APAS will be leveraged for Data Cleansing (e.g. BitBucket, Jenkins)

Terraform Scripts (Infrastructure as a code) will be used for launching AWS resources in the Gov. Cloud. Any manual updates to AWS Environment should be avoided as much as possible. However, if any such change is performed by ACRE Admins, County will explicitly communicate it to the Contractor to allow for the refresh of scripts and mirror current AWS Environment.

15. Project Fees, Expenses and Invoicing

15.1   Fees and Expenses

See Exhibit F (Fee Methodology and Payments)

The County's not to exceed fiscal obligation for the Contractor within the Agreement Resolution 076320 for this SOW # 3 and any other related data cleansing statements of work or amendments consists of the following two components:
1. Contractor cost: $3,665,540
    - Cost of Mini Data Cleansing Project: $197,500
    - Cost of this Statement of Work#3: $3,468,040
2. A maximum contingency amount $220,860 as authorized by the County's BOS for scope modifications in accordance with Exhibit A-7 (Change Control Procedures).

The Amendment 2 to Agreement dated 03/16/2020 includes the Fee Methodology and Payment schedule for a total amount of $3,468,040 from the Best and Final Offer Proposed cost, set forth as Exhibit F to Agreement Resolution 076320. Throughout the duration of the project, the APAS Executive Committee may approve scope change orders as part of the Change Control process. These change orders may then be reflected in a modified Exhibit F (Fee Methodology and Payments).

15.2   Invoicing and Payment

In accordance with BOS Resolution # 076320.

15.3   Payment Holdback

A key component of the County's risk mitigation plan is to incorporate a Payment Holdback as a component of the Fee Methodology and Payment schedule until the Contractor has successfully met the conditions of the Warranty. Outlined below are the Holdback calculations.

Ten percent (10%) of Contractor's fixed Fee amounts for each Phase, as set forth in Exhibit F (Fee Methodology and Payments for SOW # 3) will be held back by the County ("Holdback") for each Key Milestone Payment. After Contractor has successfully completed the Warranty of each Phase as defined in Exhibit A-10 (Warranty Services), Contractor may invoice County for the Holdback amount associated with each Phase.

Item#	County Payment Obligations	Amount
1	Contractor cost	$3,665,540
2	County's Scope contingency amount for change orders	$220,860
Total	Data Cleansing Contractor and Contingency Cost	$3,886,400

15.4   Rate Card

Exhibit B-1 (Rate Card for Additional Services). In no event should the rates being charged to the County by the Contractor exceed their standard GSA rates.