



# Preliminary and Investment Grade Audits

SEA is considered a premier energy consulting firm with worldwide reach and award-winning expertise. Since 2009, Sain Engineering Associates, Inc. (SEA) has provided Federal Government Agencies with preliminary assessments in compliance with EISA 2007, DODI 4170.11, and the May 2018 Executive Order 13834. The Federal Government recognizes our abilities through numerous “Excellent” CPARS ratings. Additionally, SEA’s team and processes consistently achieve recognition. Examples of our awards include:

- Secretary of the Navy - Platinum Energy Award
- Secretary of the Defense - Environmental Sustainability Award
- Department of Energy - Energy and Water Audit Awards
- Secretary of the Army - Innovative/New Technology Award in energy and water
- International Lighting Council - Exemplary Performance for Lighting
- ASHRAE - International Innovation Award

The documentation and deliverables developed by SEA through our audit process continue to be used by clients through the implementation phase of work.

SEA’s energy engineers collaborate with other team members in several delivery processes, including:

- Performance Contracting
- Traditional Design/Bid Build
- Design/Build
- Fast Track Delivery Methods

This document provides the following information capturing our processes and sample work in the Preliminary and Investment Grade Audit space:

- Sample Audit Process Sample
- Sample Audit Workplan Approval Matrix
- Preliminary Assessment and Investment Grade Assessment Workflow

## Sample Audit Process

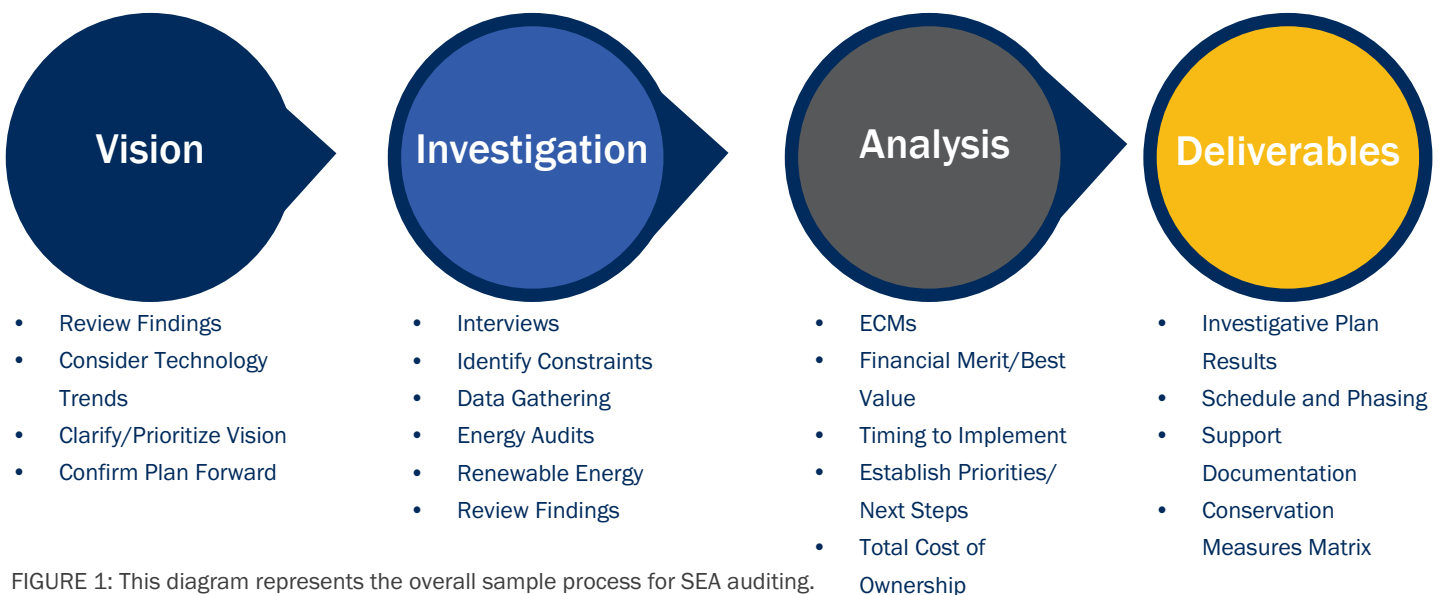


FIGURE 1: This diagram represents the overall sample process for SEA auditing.



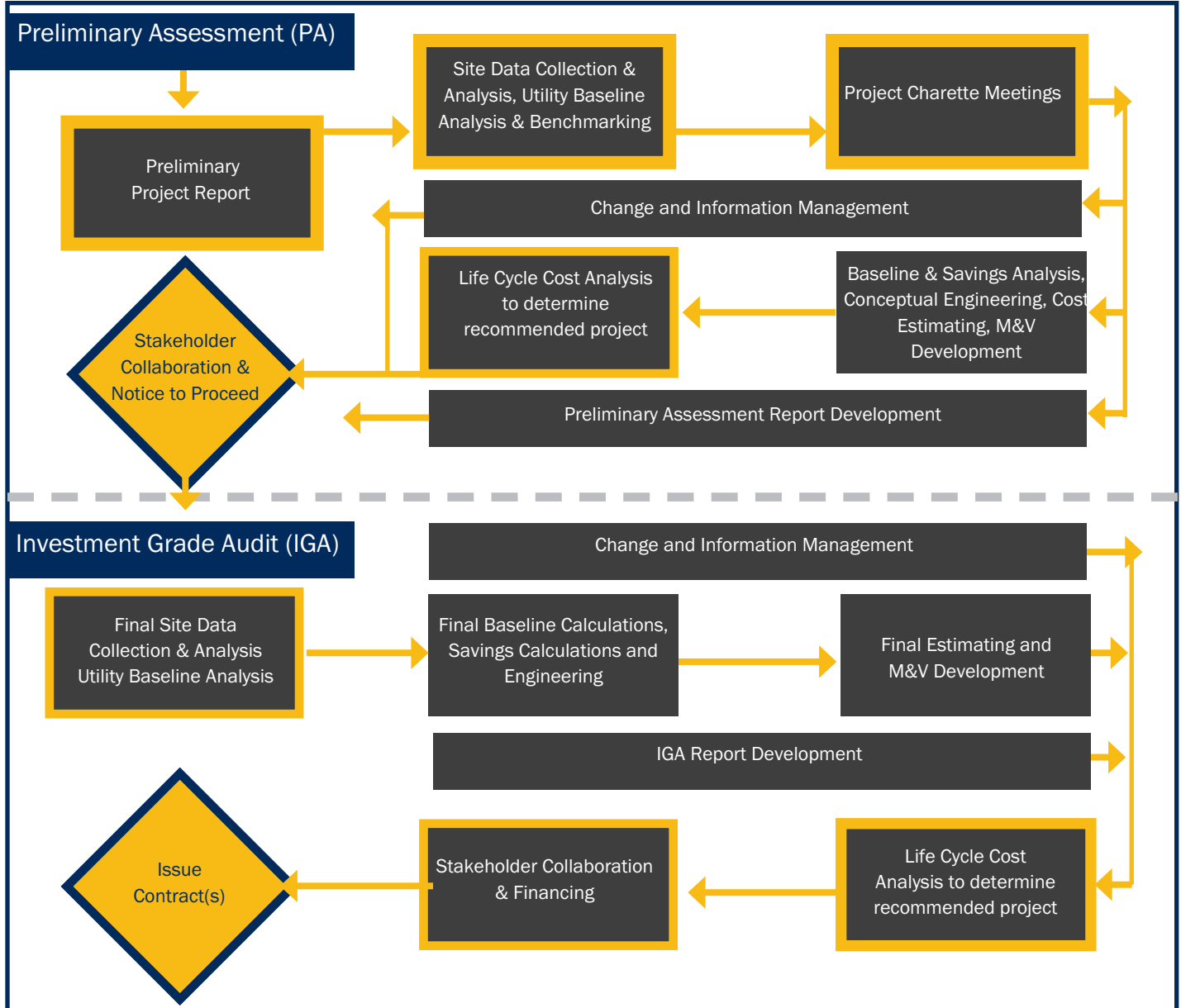
# Sample IGA Audit Workplan Approval Matrix

**FIGURE 2:** The table below summarizes the approach for audit work to support a performance contractor’s development of the scope of work, guaranteed savings, and Measurement and Verification (M&V) of the energy savings during the Investment Grade Audit (IGA). Changes and modifications may occur throughout the IGA; however, all changes must be approved by all parties. SEA will work with TVA to tailor this process to each task order scope of work issued.

	ECM Description	Scope of Work Development	Savings Analysis	M&V Approach
1	Lighting Retrofit	Room-by-room audit with planned retrofits	Pre- and post-wattage and hours of operation in the room by room audit	Retrofit isolation. Pre- and post-wattage measurements of a statistically valid sample of retrofits
2	Building Automation System	DDC points list with sequences of operation	BIN analysis utilizing local weather data and system design parameters	Baseline operating conditions documented on xx/yy/2020 and approved by owner’s facilities staff. The BAS trending capabilities will be used on a short-term basis to verify BAS operating as per ESCO design. Semi-annual visits from ESCOs Cx engineers to verify system continues to operate within design parameters.
3	New Chiller Plant	General arrangement and single-line process drawings. Equipment submittal package.	BIN analysis utilizing local weather data and system design parameters.	Use existing BAS to trend baseline CHW plant operating parameters for 60 days during IGA to determine Kw/ton at varying loads. Use BAS to trend CHW plant operating parameters to calculate post-retrofit kw/ton. Use verified data in baseline and post-retrofit BIN analysis.
4	Convert from Constant Volume to Variable Air Volume	Identify locations of boxes to be converted on the existing building HVAC plans. Equipment submittal packages for each type/size of box to be installed. DDC schematic for a sample VAV box with sequence of operations.	eQuest model to be calibrated within x%.	eQuest model for the impacted building.
5	Window Replacement	Room-by-room audit with planned retrofits.	eQuest model to be calibrated to current baseline within x%.	eQuest model for the impacted building.
6	Wall/roof Replacement or Insulation Enhancement	Room-by-room audit with planned retrofits.	eQuest model to be calibrated to current baseline within x%.	eQuest model for the impacted building.
7	Infiltration sealing.	Blower door test or smoke test on each aperture. Visual inspection?	eQuest model to be calibrated to current baseline within x%	eQuest model for the impacted building
8	New Boilers, Burners or Boiler Controls	Inspection of condition, evaluation of viability, combustion efficiency testing	Post retrofit combustion efficiency estimates	Post retrofit combustion efficiency test and/or data collected from dedicated boiler controls

# Workflow: Preliminary Assessments - to - Investment Grade Audits

FIGURE 3: This workflow chart represents the processes for Preliminary Audits and how they flow into Investment Grade Audits. You will note that all areas identified or outlined in yellow below require customer input for success.



## LEGEND



**FINAL DELIVERABLES:** All stakeholders will have the opportunity to review the results of the preliminary audit in order to determine how to proceed. The client will provide the notice to proceed and SEA will begin the Investment Grade Audit (IGA) based on preliminary audit results in order to issue the final contract.



**CLIENT INPUT:** All areas outlined in yellow will require client involvement in the workflow process.



**SEA WORKFLOW:** All grey boxes indicate areas of SEA only workflow and project development.