DEPARTMENT OF
ENVIRONMENTAL PROTECTION
MONTGOMERY COUNTY • MARYLAND

MSW Management Systems Analysis

MSW Process Technology Assessment & SWAC Discussion Meeting – 5.01.2024

Aiming for Zero Waste
A Vision for Sustainable Materials Management in Montgomery County

Agenda

1. Welcome and Introductions (5 minutes)
2. Presentation by Arcadis (20 Minutes)
3. Stakeholder Feedback/Discussion (30 Minutes)
4. Next Steps and Closing (5 minutes)

WELCOME & INTRODUCTIONS

JON MONGER, DIRECTOR

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Team - Structure

DEPARTMENT OF
ENVIRONMENTAL PROTECTION
MONTGOMERY COUNTY • MARYLAND

Barton
&Loguidice

MSW Consulting Engineers, Planners & Scientists

ARCADIS

EA

Team - Roles

1. **DEP/RRMD**
   - Establishing and Executing the Vision, Goals, and Objectives
   - Management and Operational Oversight of Existing MSW System
   - Implementation with Contract Administration, Outreach, and Education

2. **B&L**
   - Technical Consultant providing Staff Augmentation Resources
   - Program/Project Development and Stakeholder Engagement Support
   - Integration of Implementation Considerations into Arcadis Analysis

3. **Additional Consultants:**

   Arcadis - Technical Consultant for MSW Management Systems Analysis including MSW Processing Technologies, Cost/Benefit and Life Cycle Analyses, Draft REOI/RFP for Preferred Alternative MSW Management System

   EA Engineering - Technical Consultant for Organics Management Siting Study and Future Food Scraps/Yard Trim Organics Management Facility

ARCADIS

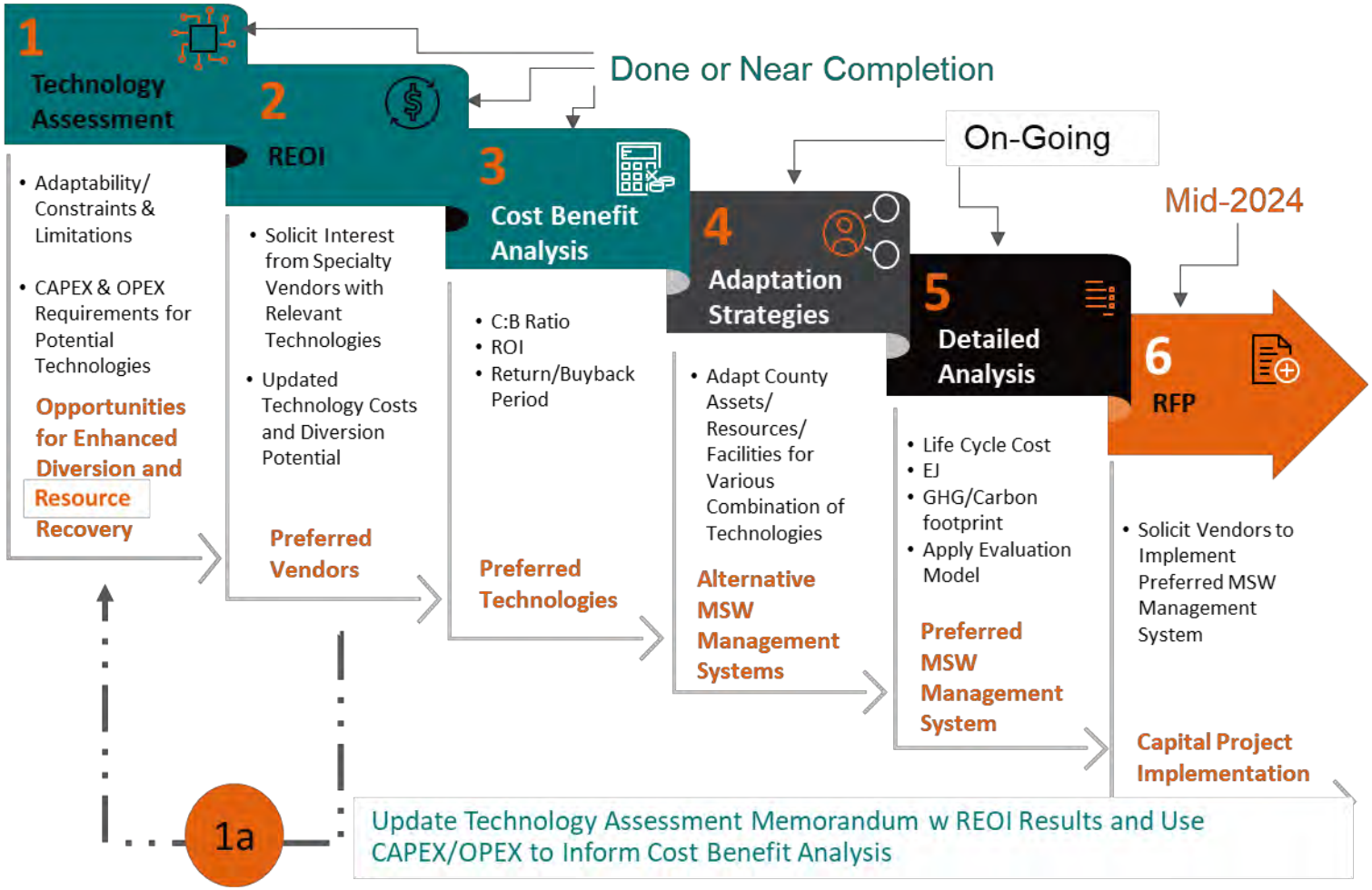
Sustainable
Project Choices

MSW Management System Analysis Montgomery County, MD DEP

Solid Waste Advisory Committee Meeting – May 1, 2024

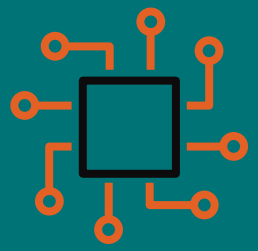
Steve Nesbitt, Vice President

MSW System Analysis Approach



Opportunities for Enhanced Diversion and Resource Recovery via a Short-List of Viable MSW Processing Technologies Which are Adaptable to Shady Grove Transfer Station and/or Dickerson Facility

1 Technology Assessment



Assessment/Evaluation of Technologies

Opportunities for Enhanced Diversion and Resource Recovery via a Short-List of Viable MSW Processing Technologies which are Adaptable to Montgomery County Shady Grove Transfer Station and/or Dickerson Facility

Methodology Used in Our Assessment

Technologies Evaluated to Achieve Diversion/Resource Recovery and Offsetting Revenues

County Facilities Available for Adaptation to Meet Change in Goals and Objectives.

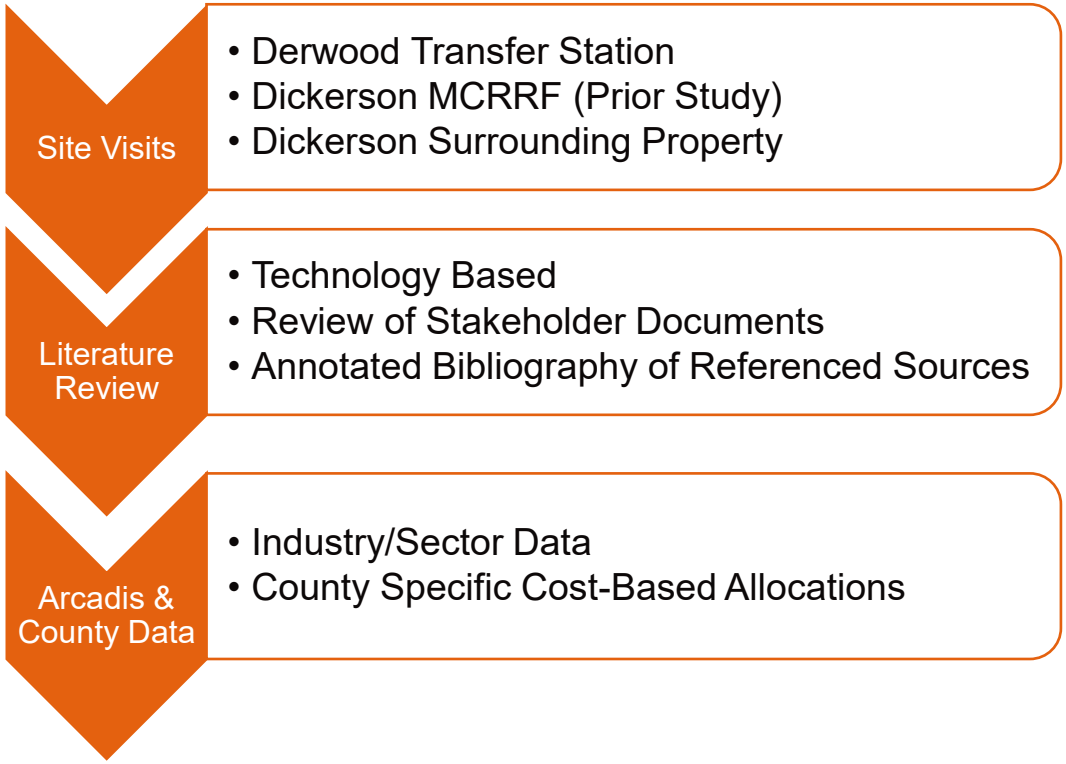
Assessment of Technology Cost and Adaptability of Available Facilities

Methodology Used in Our Preliminary Assessment of Opportunities for Enhanced Diversion and Resource Recovery from Waste

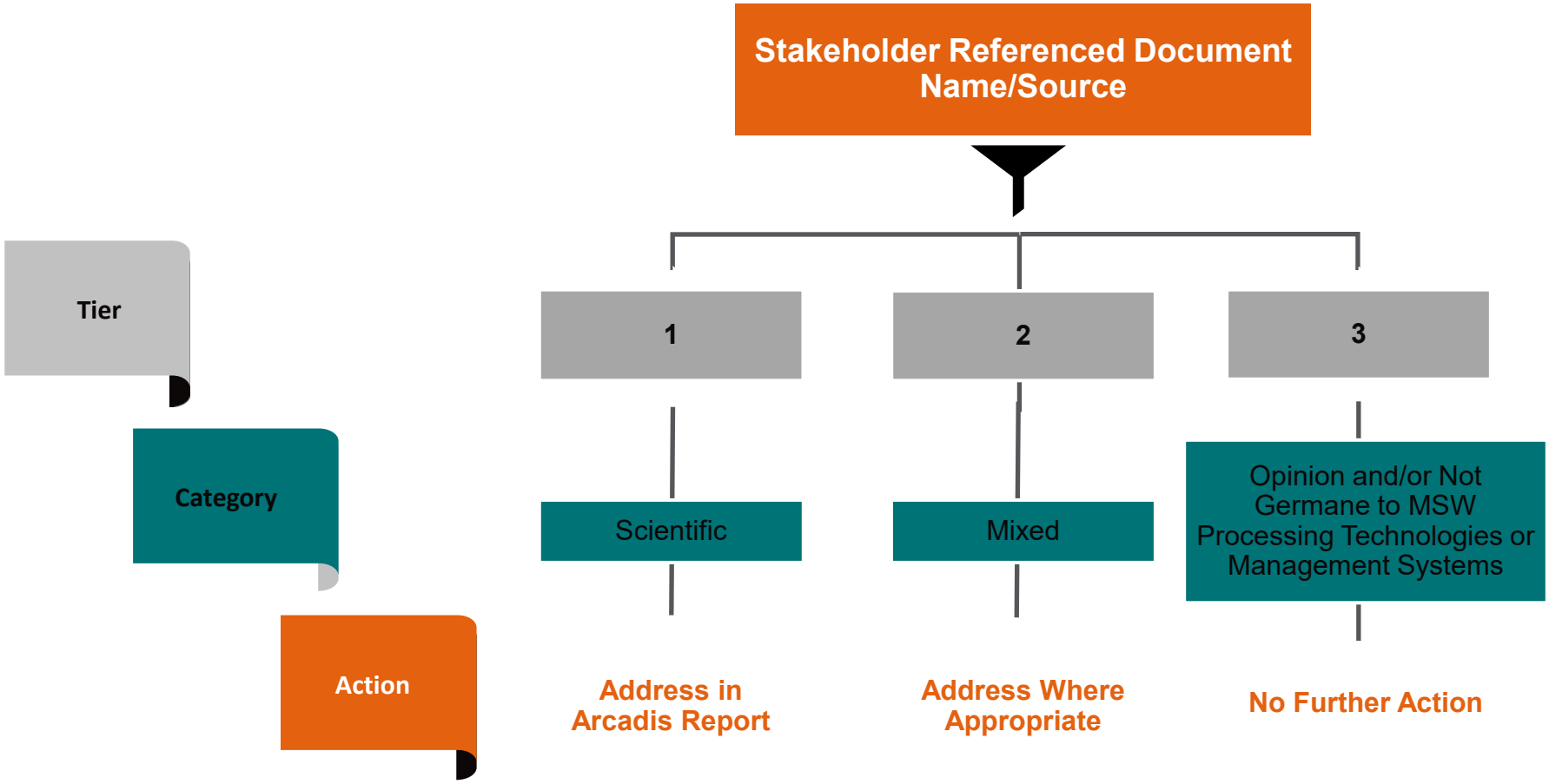
ARCADIS

Adaptability/ Constraints & Limitations

Capital & Operating Expense Requirements for Potential Technologies



Stakeholder Analysis/Document Filter



Overview of Technologies Considered

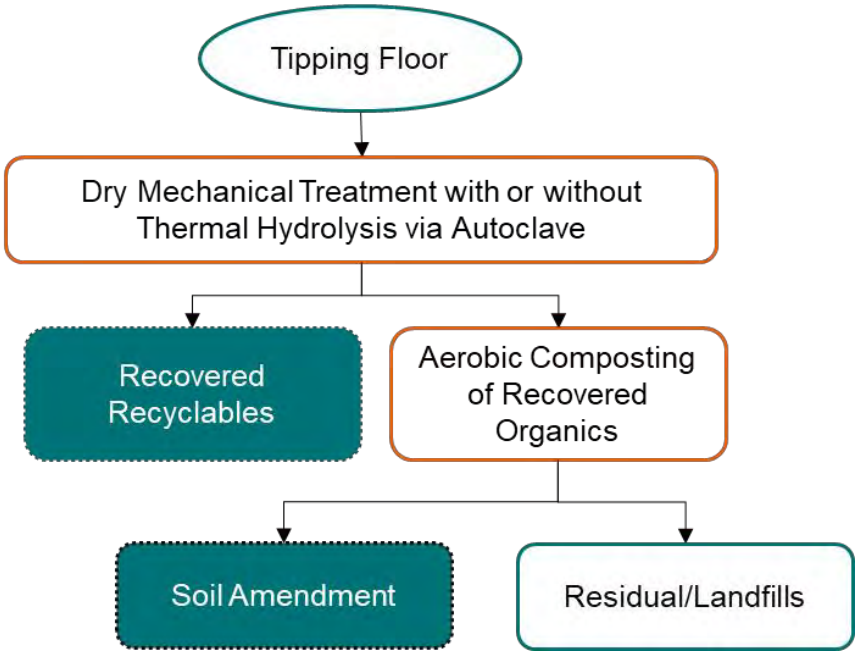
Mixed Waste Processing		**Combined with Dual Stream Recycling and Source Separated Organics** **Materials Recovery with Biological Treatment (with/without Thermal Hydrolysis)**
Source Separated Organics & Composting		**Aerated Static Pile w Membrane at MCYTCF** **In-Vessel Composting**
CDD Recycling		**Recycling of Concrete, Brick, Rock/Stone/Earth & Other Building Materials**
Enhanced MRF		**Glass** **Advance Processing & Recovery of Recyclable Materials**
Co-Located Revenue Generation		**Anaerobic Digestion with RNG from Biogas** **Solar Electricity/'Green' Hydrogen**

Mixed Waste Processing

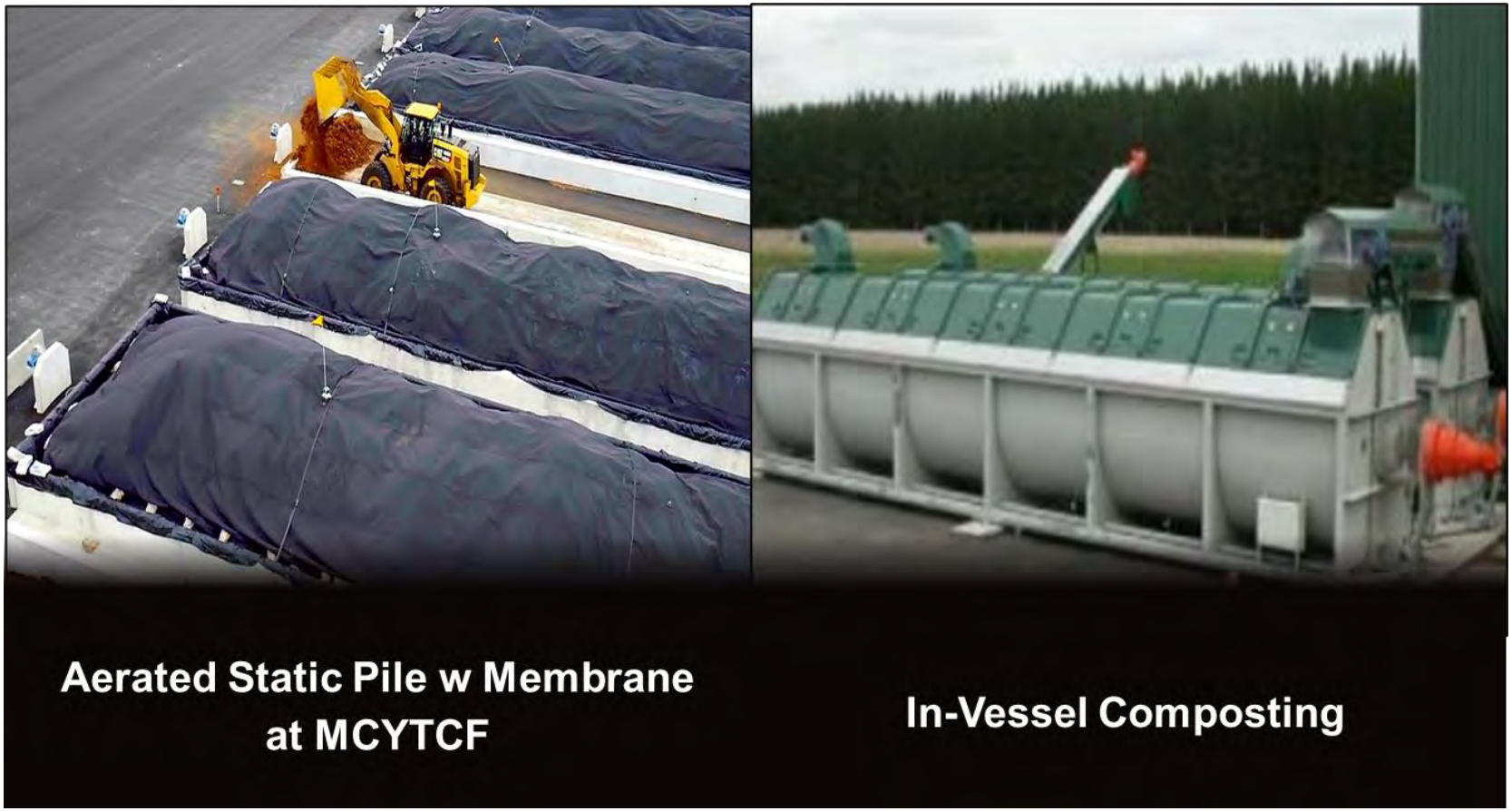
ARCADIS

Combined with Dual Stream Recycling and Source Separated Organics

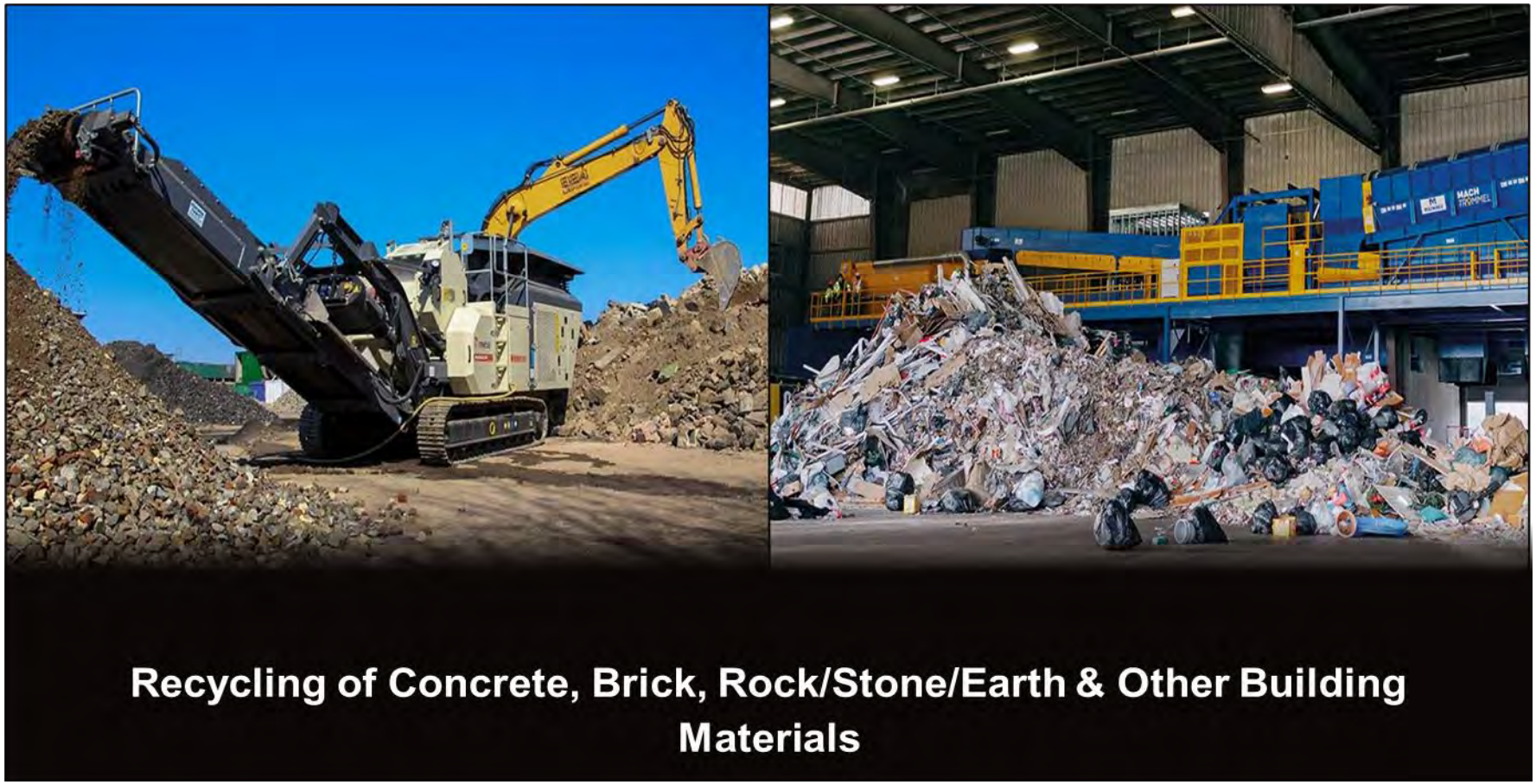
Materials Recovery with Biological Treatment



Source Separated Organics - Composting



CDD Recycling



Recycling of Concrete, Brick, Rock/Stone/Earth & Other Building Materials

Co-Located Revenue Generating

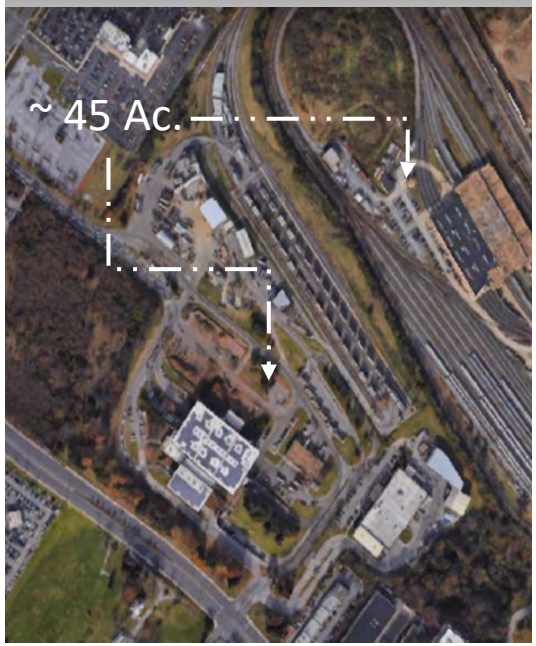
Anaerobic Digestion with RNG from Biogas

Solar Electricity/'Green' Hydrogen

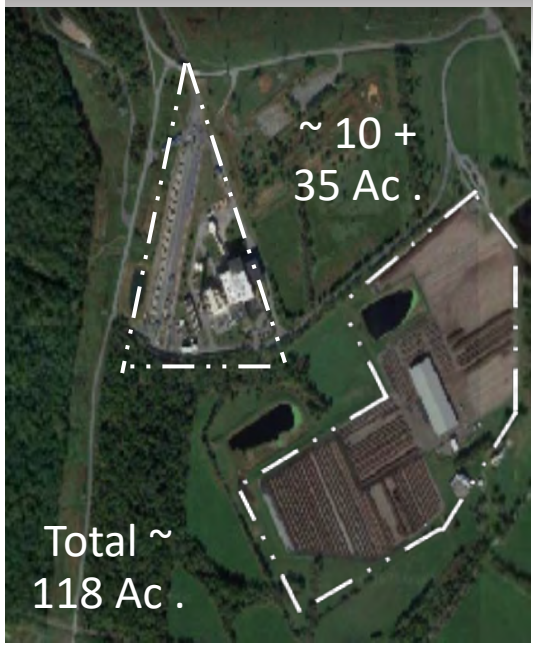
County Assets Including Constraints & Limitations

ARCADIS

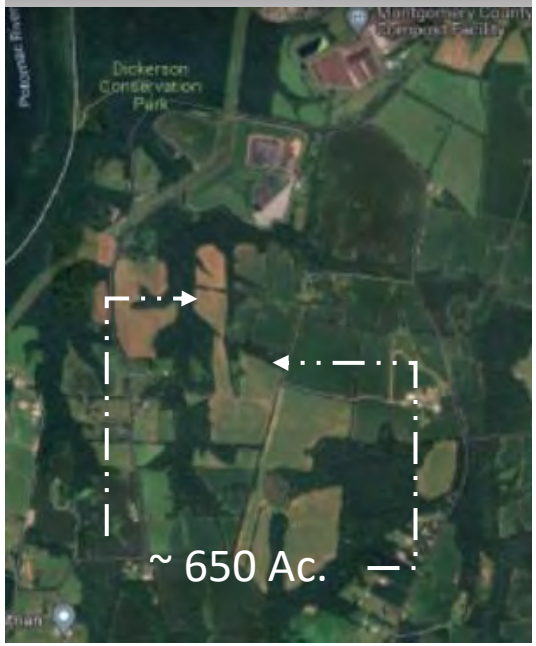
Derwood Transfer Station & MRF



Dickerson MCRRF/MCYTCF



Dickerson Site 2 Landfill



Analysis of Various MSW Processing Technologies

Waste Processing and Revenue Generating Technologies	Cost Component						Effectiveness
	CAPEX		OPEX		TOTAL		Incremental Diversion
	$/TPY Processing Capacity	Lifecycle NPV $/Ton	$/TPY Processing Capacity	Lifecycle NPV $/Ton	$/TPY Processing Capacity	Lifecycle NPV $/Ton	(%)

Estimated Capital Cost for Recent MWP/MRBT Facilities

Source	Project Year	Capacity (tons/yr.)	Capital Cost New Facility	Rough Order Magnitude CAPEX $2024
Monroe County, IN	2018	130,000	$ 40,000,000	$ 47,507,452
San Leandro, CA	2020	150,000	$ 120,000,000	$ 133,046,145
Santa Barbara, CA	2021	180,000	$ 130,000,000	$ 139,259,250

Preferred MSW Processing Vendors & Technologies

2

REOI

Status Update of REOI

Date of Issue:

January 26, 2024

Pre-Submission Conference:

February 21, 2024

Responses Received:

March 26, 2024

QSC Review Expressions of Interest

April 30, 2024

Vendor Expressions of Interest Inform On-Going Technology Assessment & Cost-Benefit Analysis

Preferred MSW Processing Technologies

3 Cost Benefit Analysis

Cost Benefit Analysis Approach

Waste Processing and Revenue Generating Technologies	Cost Benefit Analysis			
	Incremental Diversion (%)	C:B Ratio	Return on Investment (%)	Buy-Back Period (Years)

Financial Model

ARCADIS

MSW Processing Technologies

Co-Located Revenue Generating Technologies

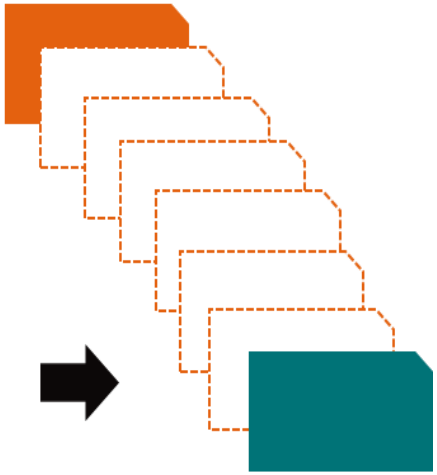
MWP | MRBT | Anaerobic Digestion | Composting Expansion | CDD Recycling | Long Haul Out of County Landfill | Site 2 Landfill Development | Solar/Biofuel/ Hydrogen

Cost-Benefit Calculations

- Cost : Benefit Ratio
- ROI
- Return Period
- % Diversion

Expenditure Schedules & Net Present Value

- CAPEX
- OPEX
- Avoided Cost by Increased Diversion
- Revenue
- **NPV Lifecycle Cost**



Overview | Technology | REOI | Cost-Benefit | Adaptation | Analysis | RFP

Alternative MSW Management Systems

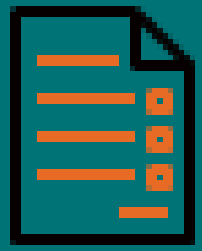
Alternative MSW Management System Components

ARCADIS

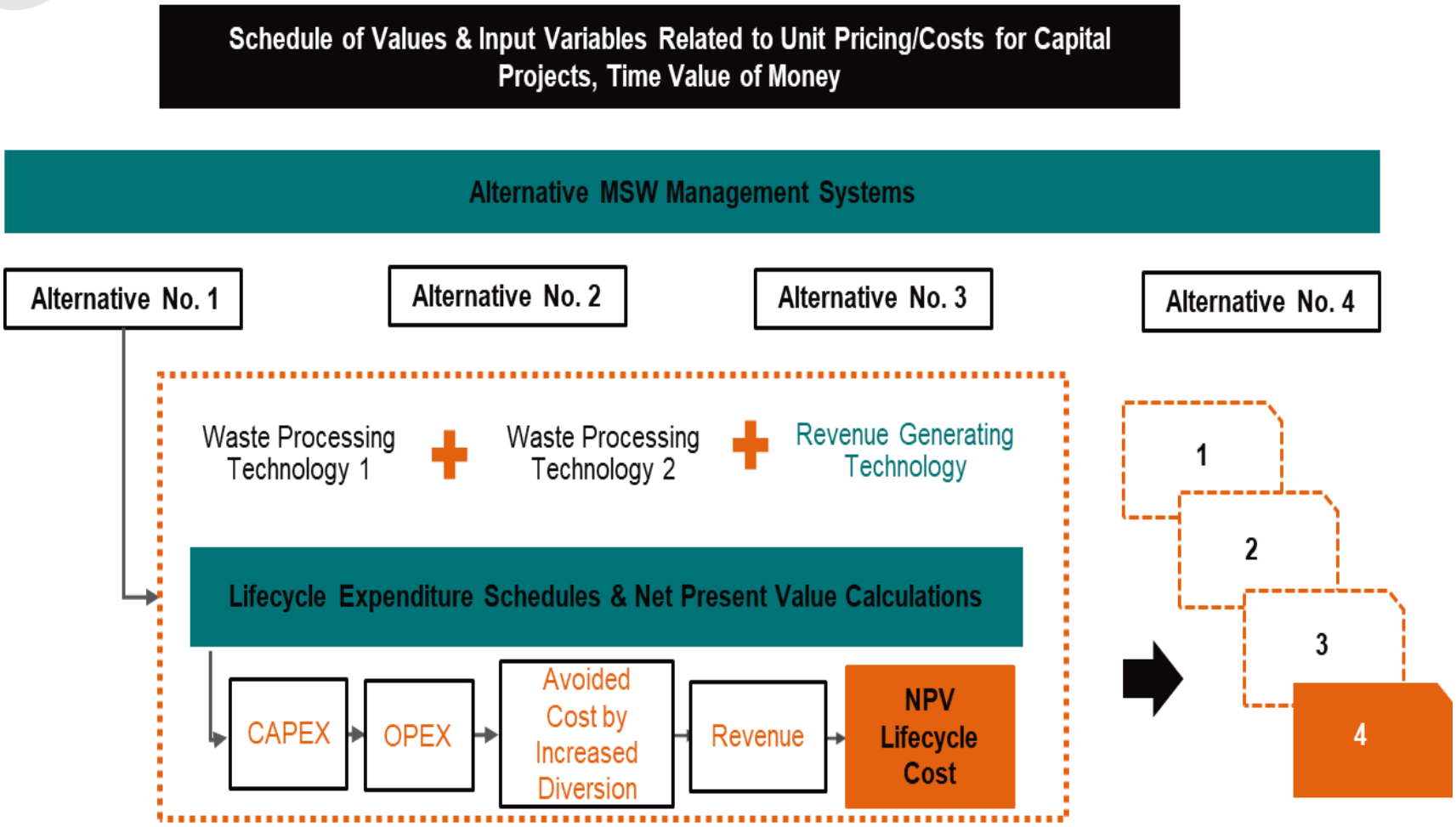
Material	Processing Technology	Transfer & Hauling	Location
MSW	MWP & MRBT	Material Transfer	Derwood
SSO	WTE/RRF	Rail Haul	Dickerson
CDD	MSWLF	Truck Haul	Site 2
Glass	Anaerobic Digestion		Out-Of-County MSWLF
	Composting		
	Recycling		

Preferred MSW Management System

5 Detailed Analysis

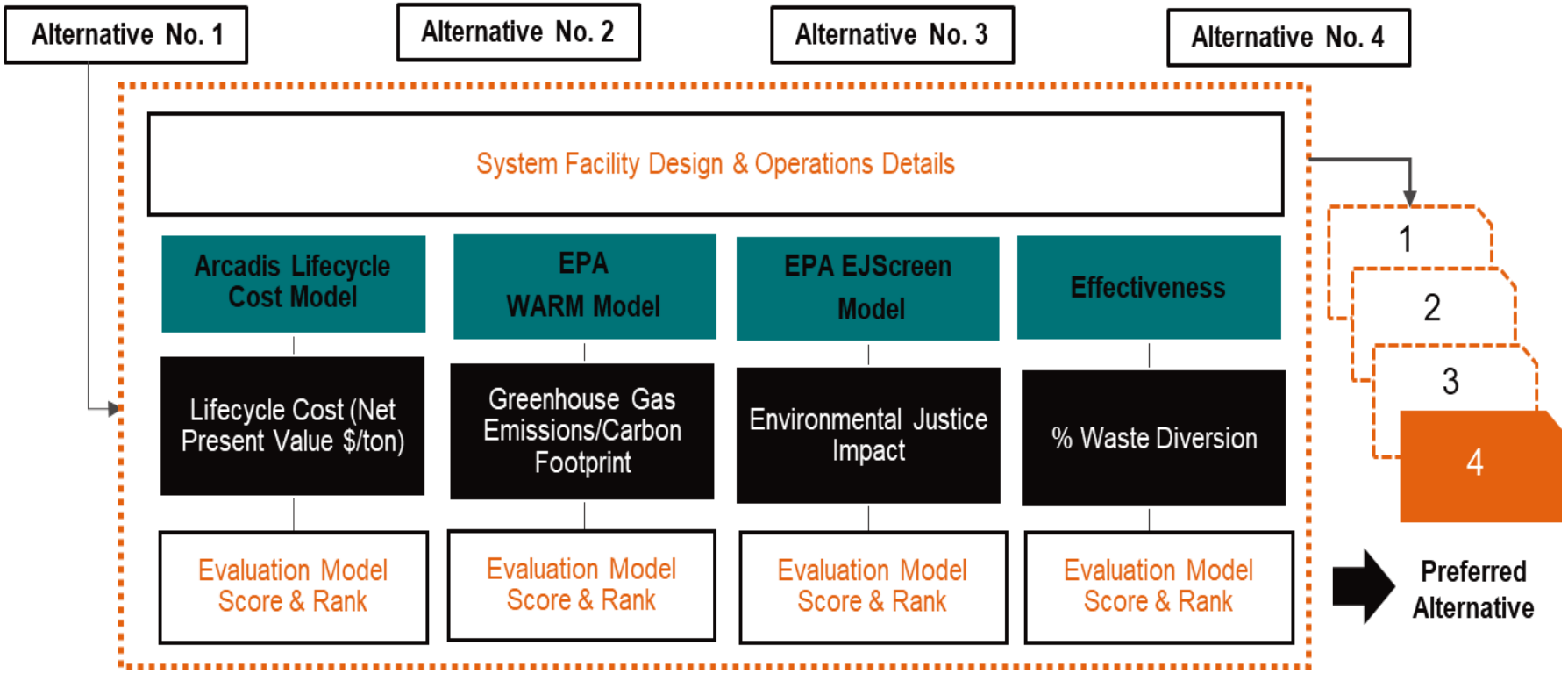


Lifecycle Cost Analysis – Financial Model

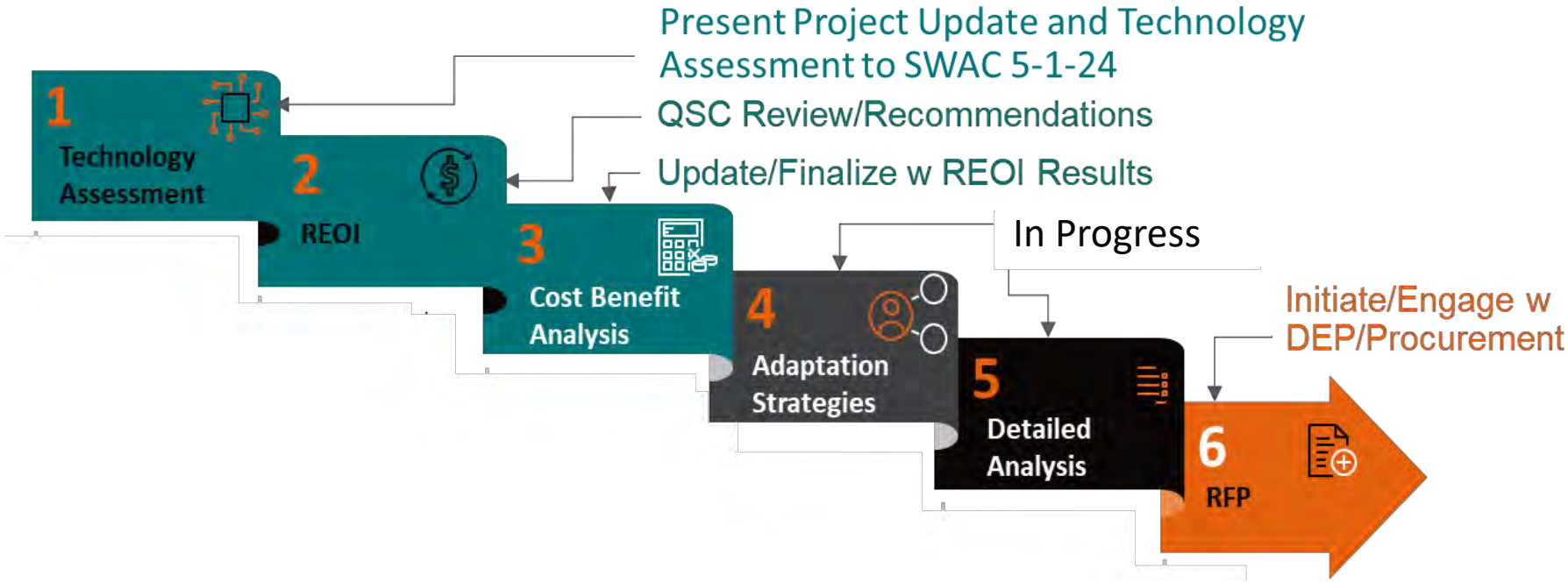


Evaluation Model

Alternative MSW Management Systems



Next Steps


Present Project Update and Technology Assessment to SWAC 5-1-24
QSC Review/Recommendations
Update/Finalize w REOI Results
In Progress
Initiate/Engage w DEP/Procurement
1
Technology Assessment
2
REOI
3
Cost Benefit Analysis
4
Adaptation Strategies
5
Detailed Analysis
6
RFP

Stakeholder Feedback and Discussion

NEXT STEPS AND CLOSING

JON MONGER, DIRECTOR

DEPARTMENT OF ENVIRONMENTAL PROTECTION