

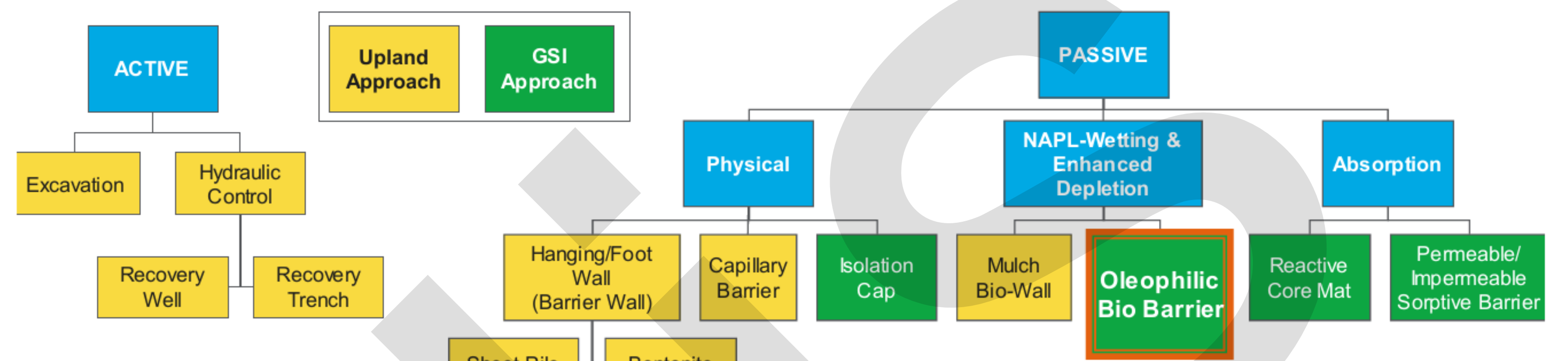
The Oleophilic Biobarrier (OBB)

April 18, 2024

WHAT IS AN OBB?

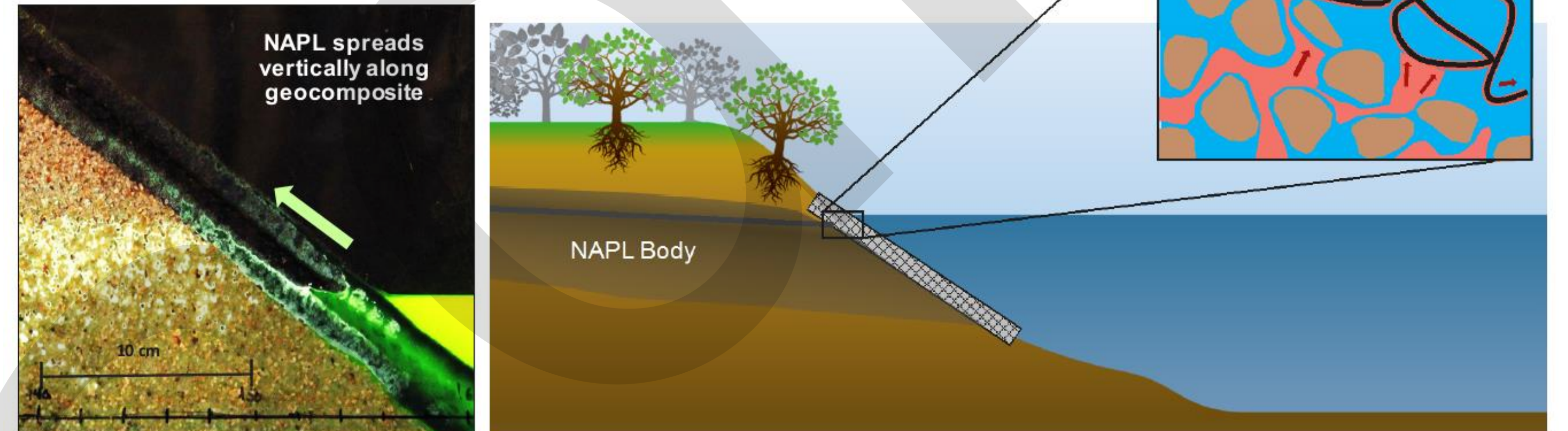
- Intercepts and degrades petroleum NAPL at the groundwater surface water interface. The OBB was named after its oil-attracting properties (oleophilic) and the ability of naturally-occurring microorganisms to degrade the sorbed petroleum hydrocarbons (bio barrier), thereby preventing sheens from forming.
- OBB is an innovative, patented application of a commercially available materials that is relatively inexpensive and readily available.
- OBB is a sustainable, low-maintenance, low capital cost sheen control measure.

SEEP MITIGATION APPROACHES

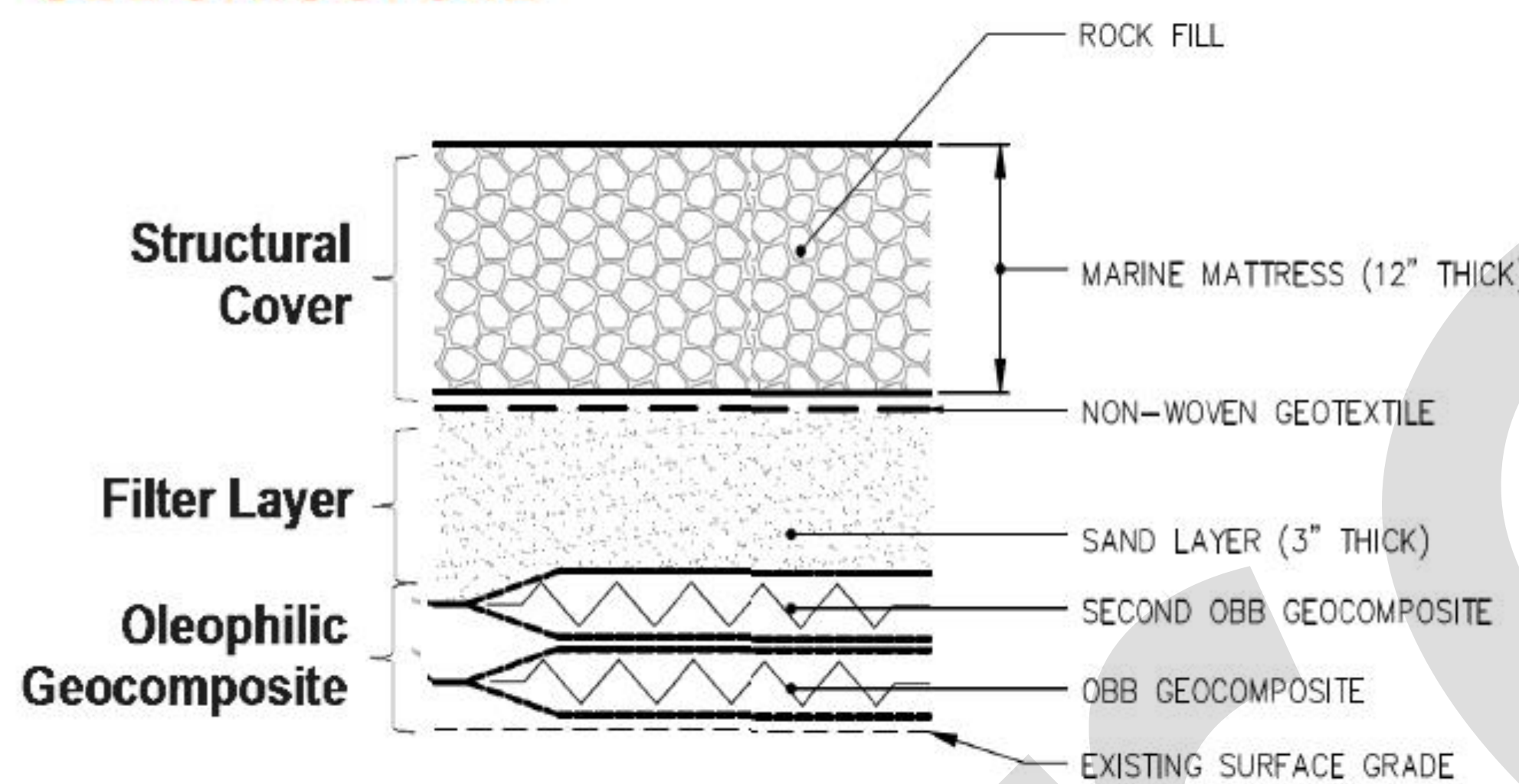


HOW DOES AN OBB WORK?

- Key Mechanisms
- NAPL wetting and wicking
 - Biodegradation



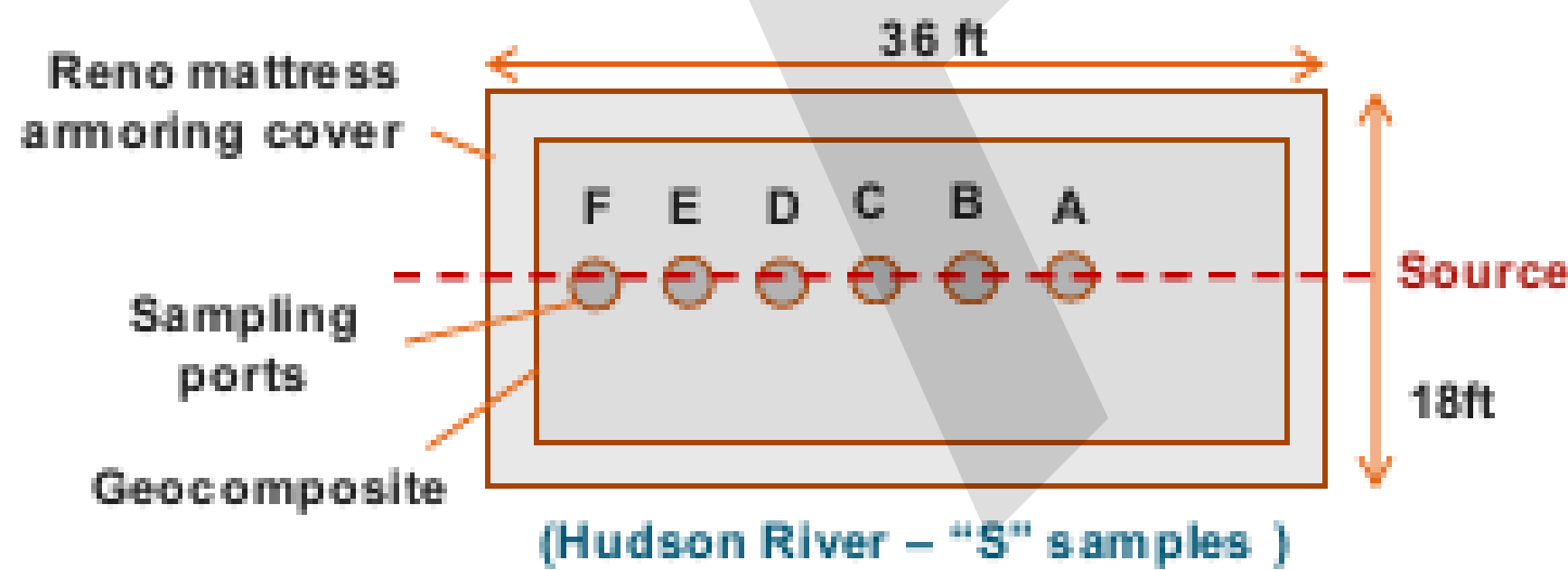
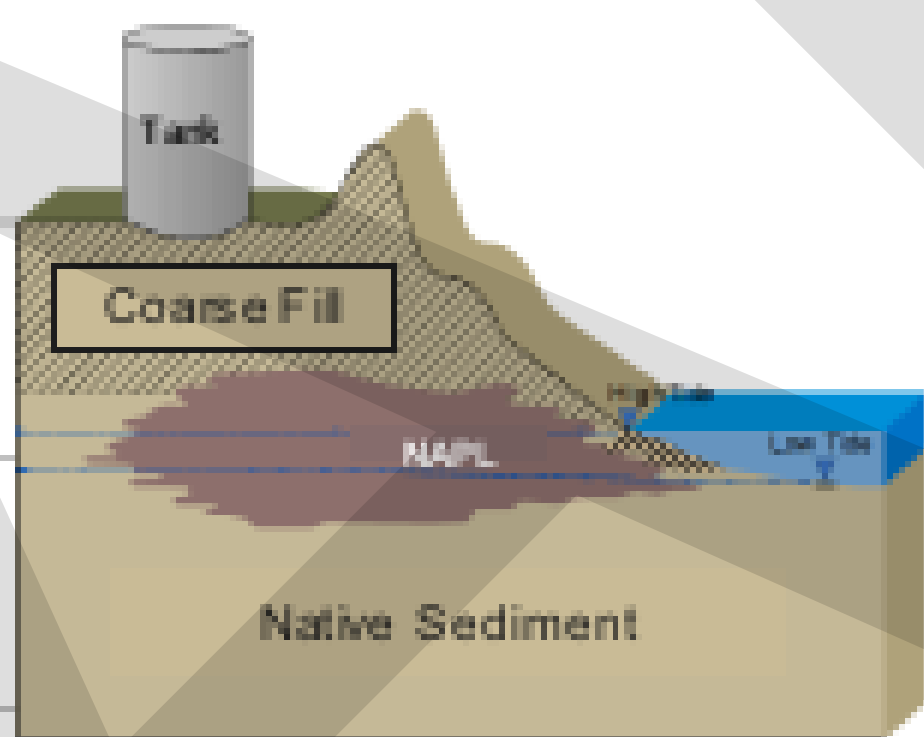
OBB STRUCTURE



FIELD DEMONSTRATION

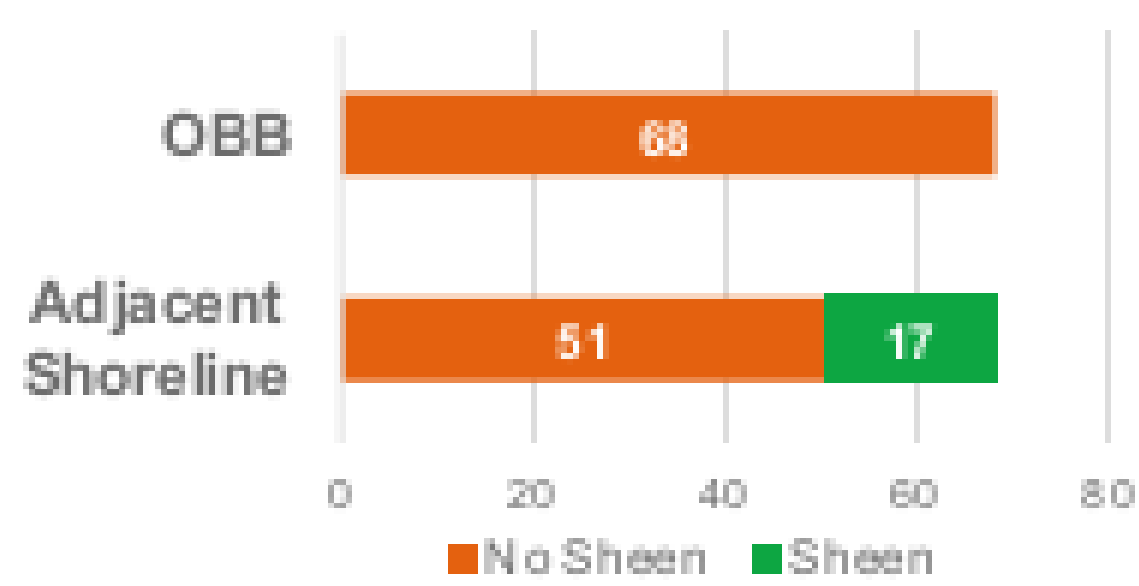
Site Characteristics

- Historic diesel release
- Tidally influenced river
- Residual NAPL saturations in shoreline sediments
- Sporadic sheen occurrence



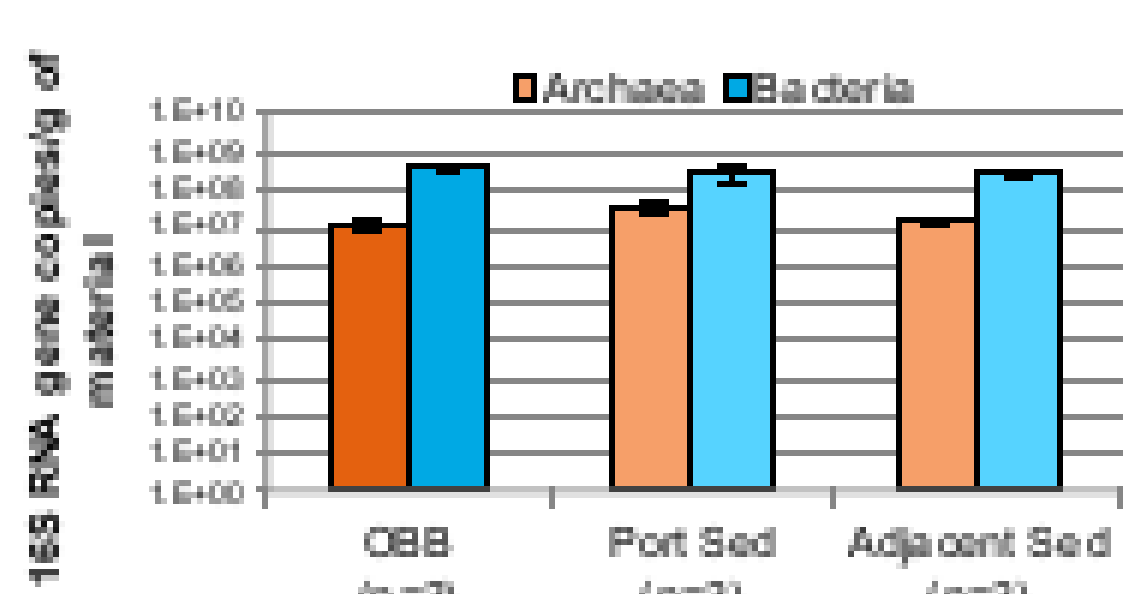
Sheen Observations

Sheens only observed coming from control sediments



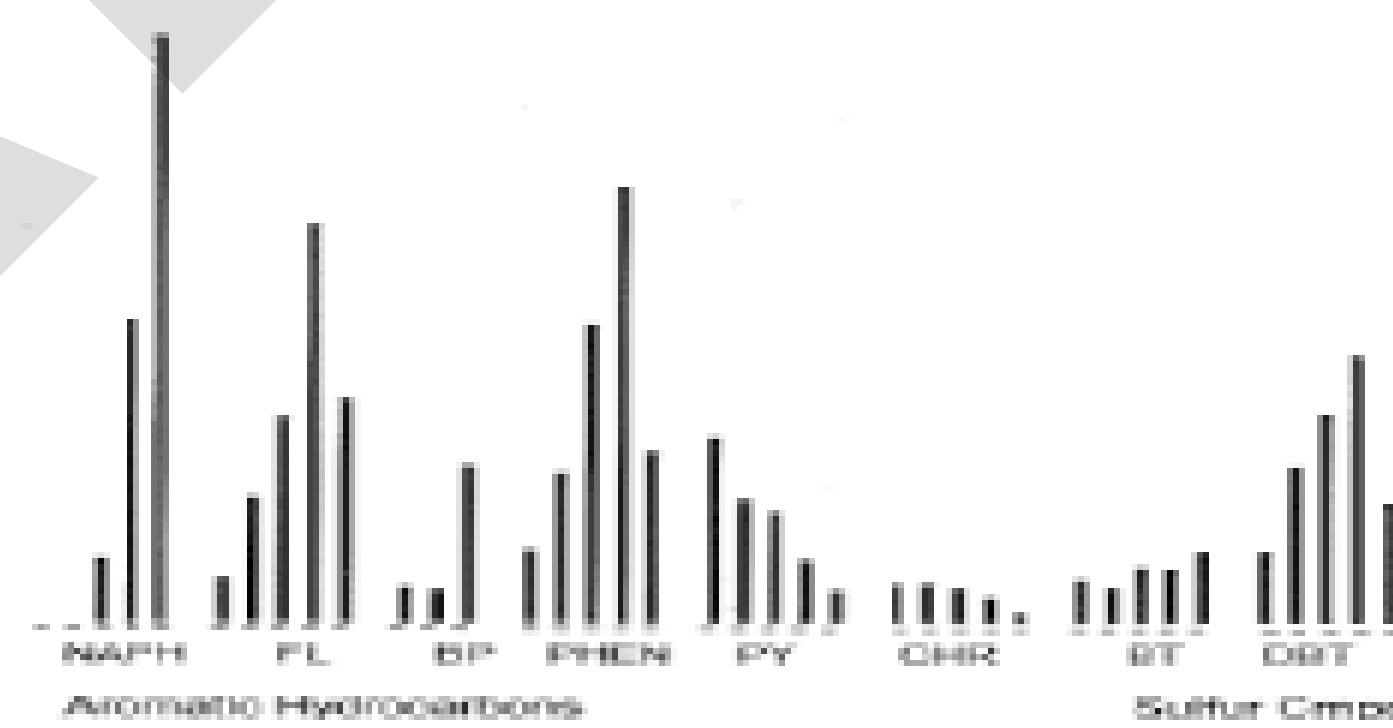
qPCR Average Gene Counts

OBB colonized comparably to control sediments



PAH Biomarker Fingerprinting

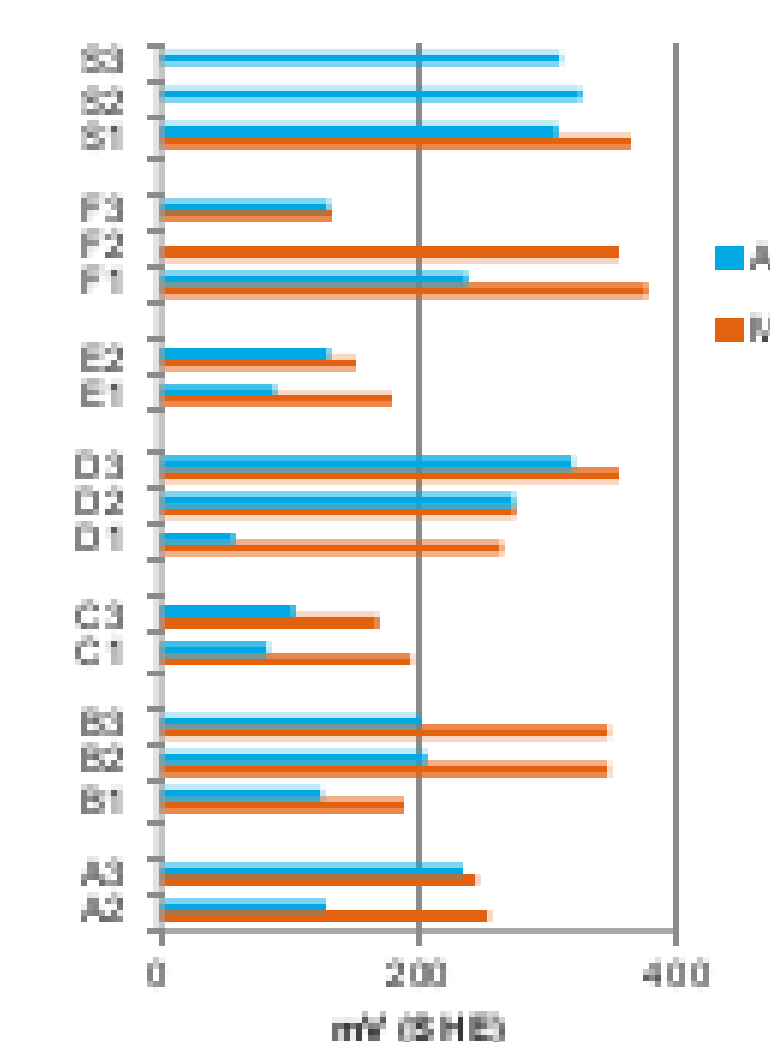
Decreasing petrogenic content and shift in homolog groups provided evidence that NAPL on OBB biodegraded



Location	Time	Petrogenic Content	Degradation
A	May	MED	LOW
	Aug	LOW	HIGH
	Nov	ABSENT	N/A
B	May	LOW	MED
	Aug	LOW	LOW
	Nov	MED	HIGH
E	May	LOW	LOW
	Aug	LOW	HIGH
	Nov	ABSENT	N/A

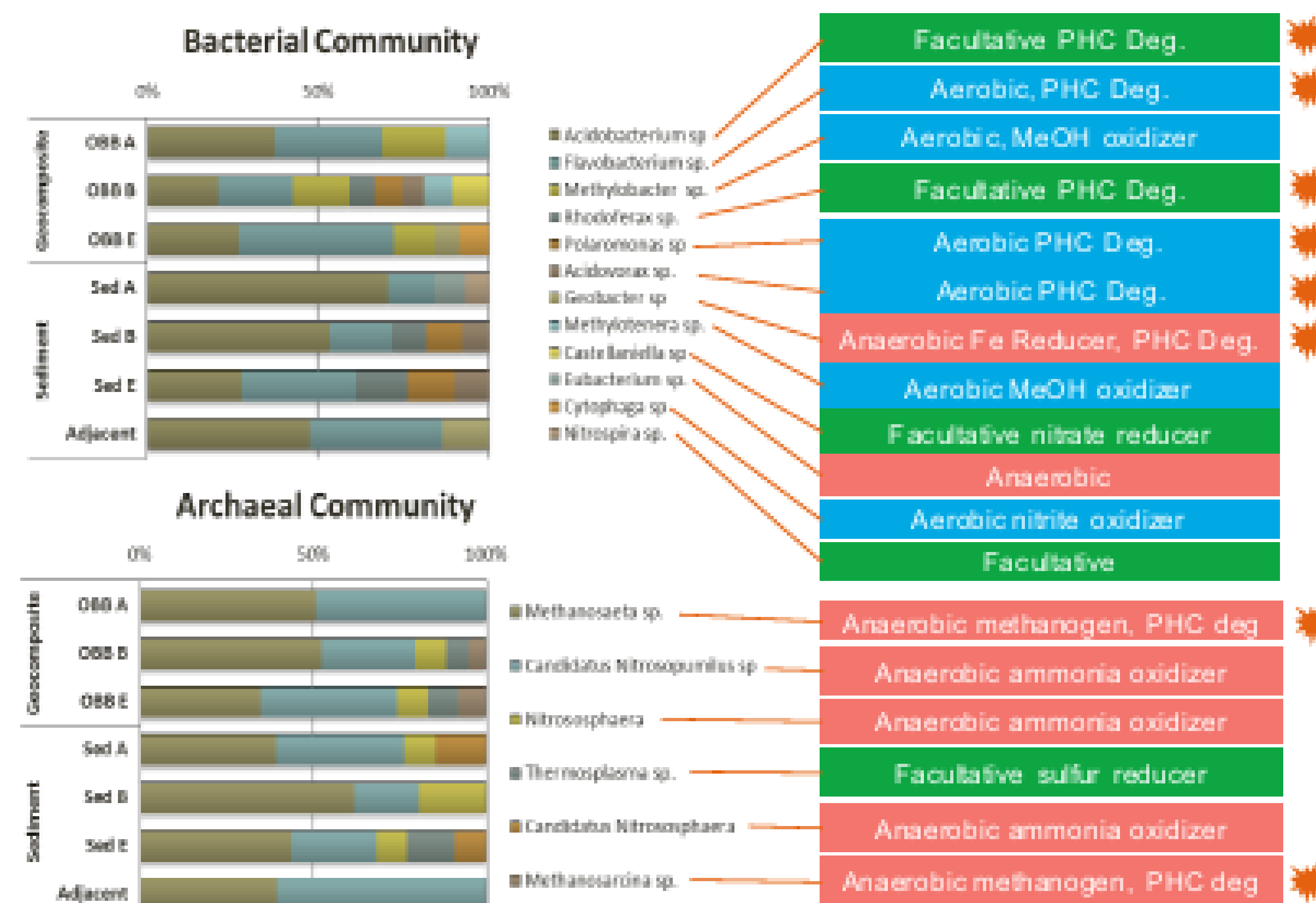
Porewater Redox Potential (ORP) Under OBB

Aerobic conditions maintained in porewater up to 3 feet under OBB



Microbial DNA Sequencing

Diverse range of microbes including aerobic and anaerobic hydrocarbon degraders found in OBB



Legend:



Associated with Petroleum Hydrocarbon Degradation (PHC Deg)