

RepMet Conceptual Data Model

Repository Systems Status Update

April 2017, Paris France

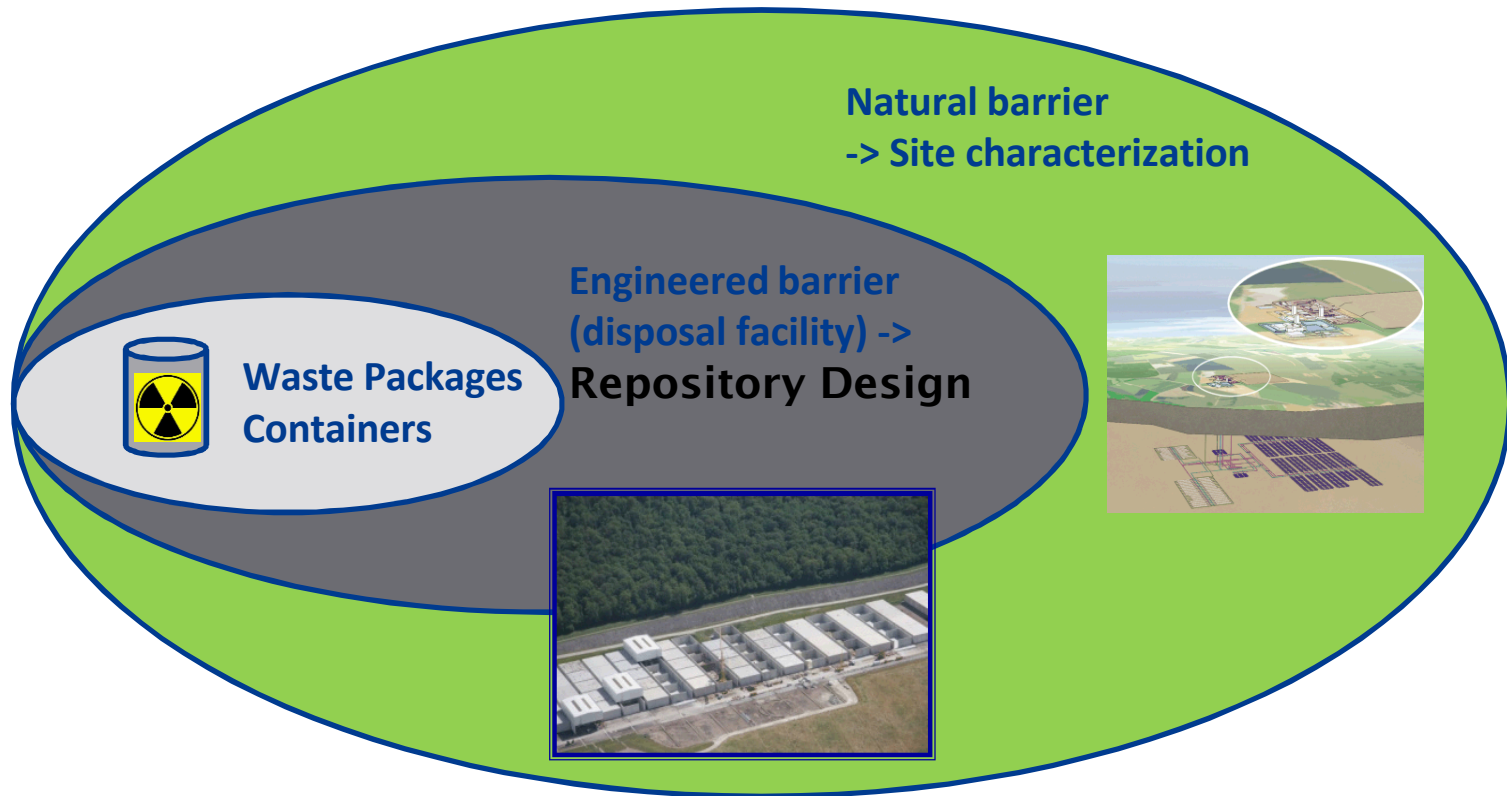
Presented to: 7th Meeting of the RepMet Initiative

Outline

- Repository CDM
 - Background
 - Document hierarchy and names
 - Current iteration of Repository CDM
 - Entity definitions
 - Current iteration of Mind Map
- What do we need to do next?
 - Receive input from team for library
 - Discuss interfaces with Site Characterization, Waste Package and generally with RK&M activities
 - Complete the metadata information for entities and attributes
- Discussion

Repository CDM - Background

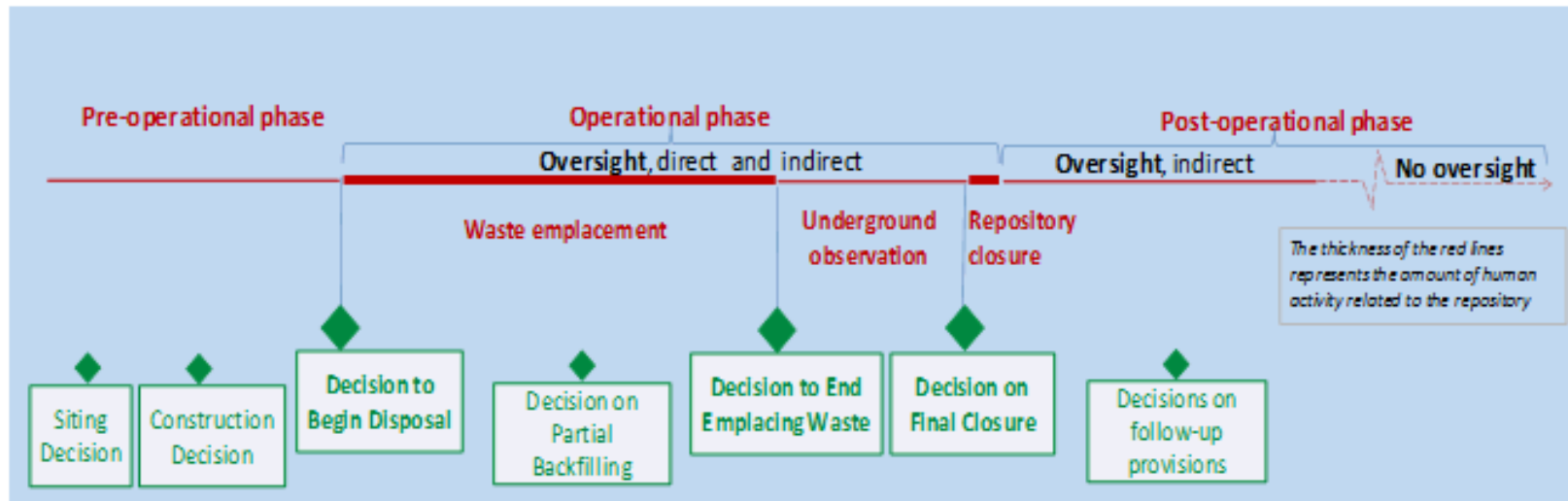
- Spatial organization for the repository data model.



Spatial Organization of Repository

Repository CDM – Background (continued)

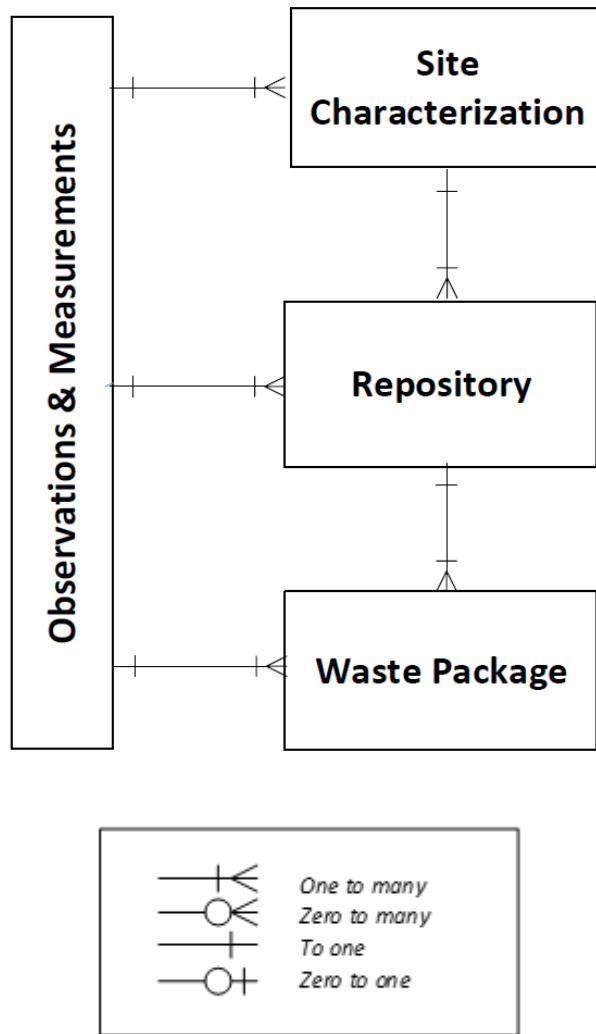
- Temporal aspects for the repository data model
- Pre-operational / Operational / Post-Operational



Phases of Repository

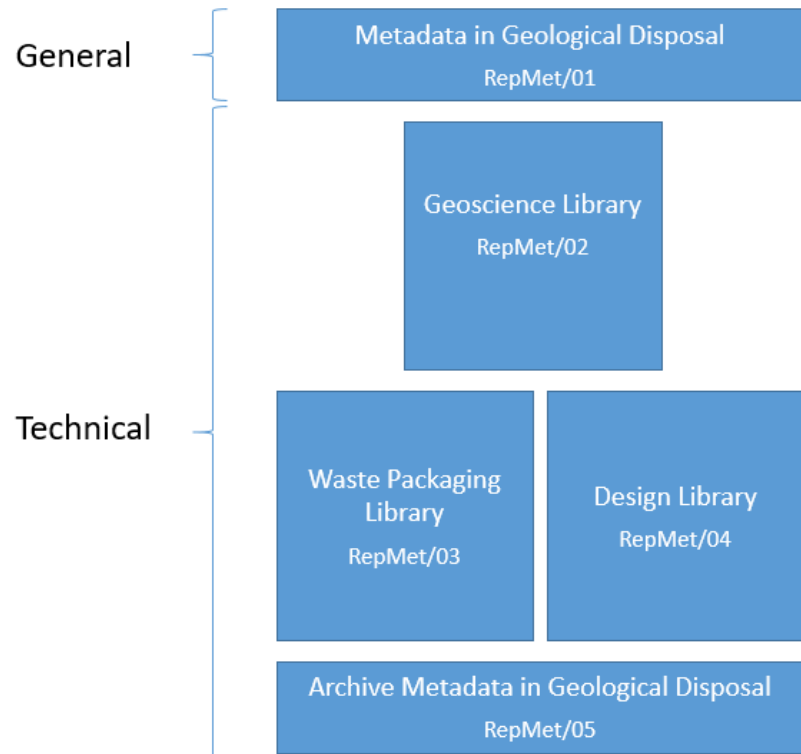
- Decision: Repository CDM to address Post-Operational Phases
 - At time of closure (post-operational) we can consider the CDM stable, useful and mature and
 - The RepMet Library (set of metadata) is a complete list of data which may be used

High Level CDM for RepMet Documents



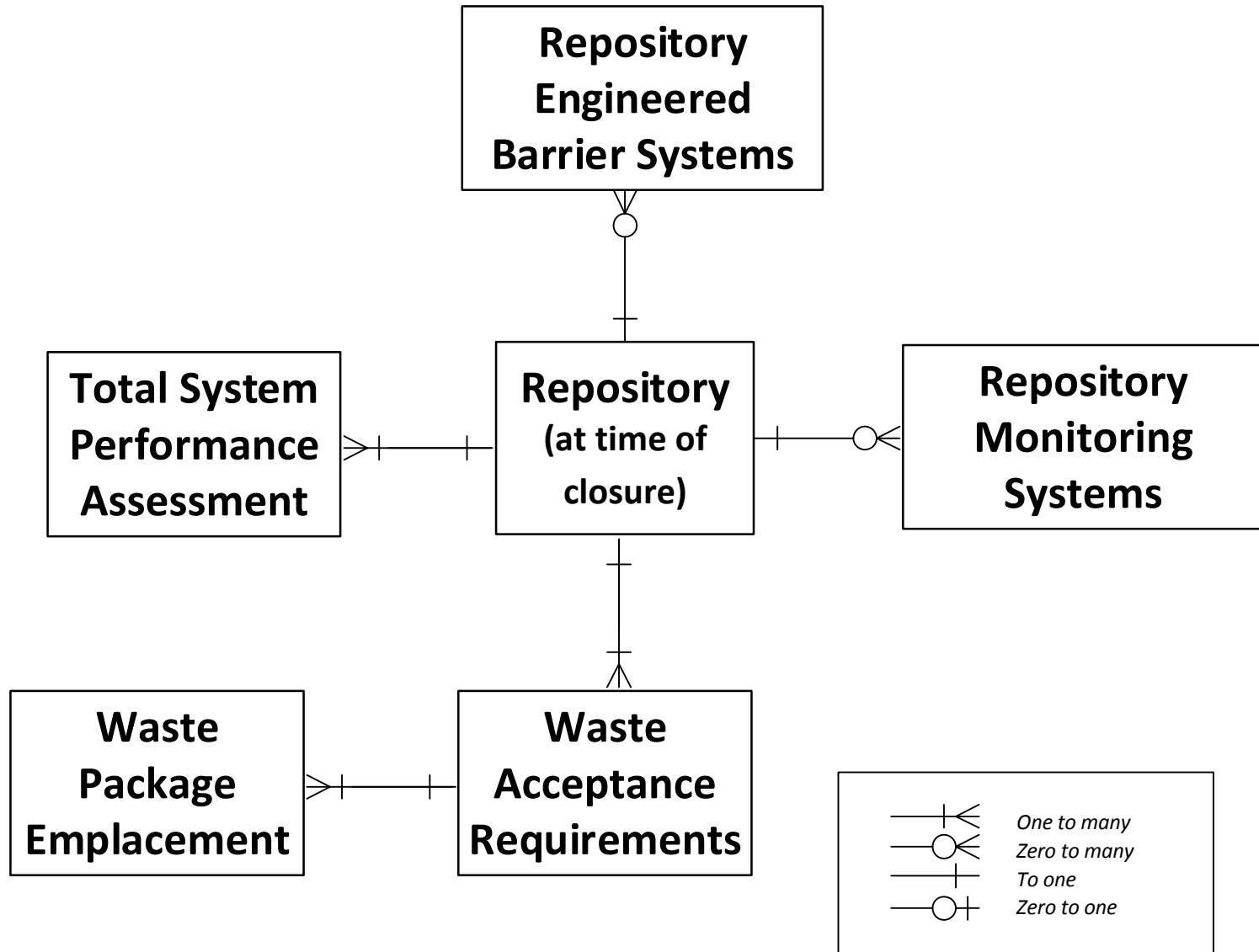
Document Names:

- Site Characterization Library = Geoscience Library
- Repository Library = Design Library
- Waste Package Library = Waste Packaging Library



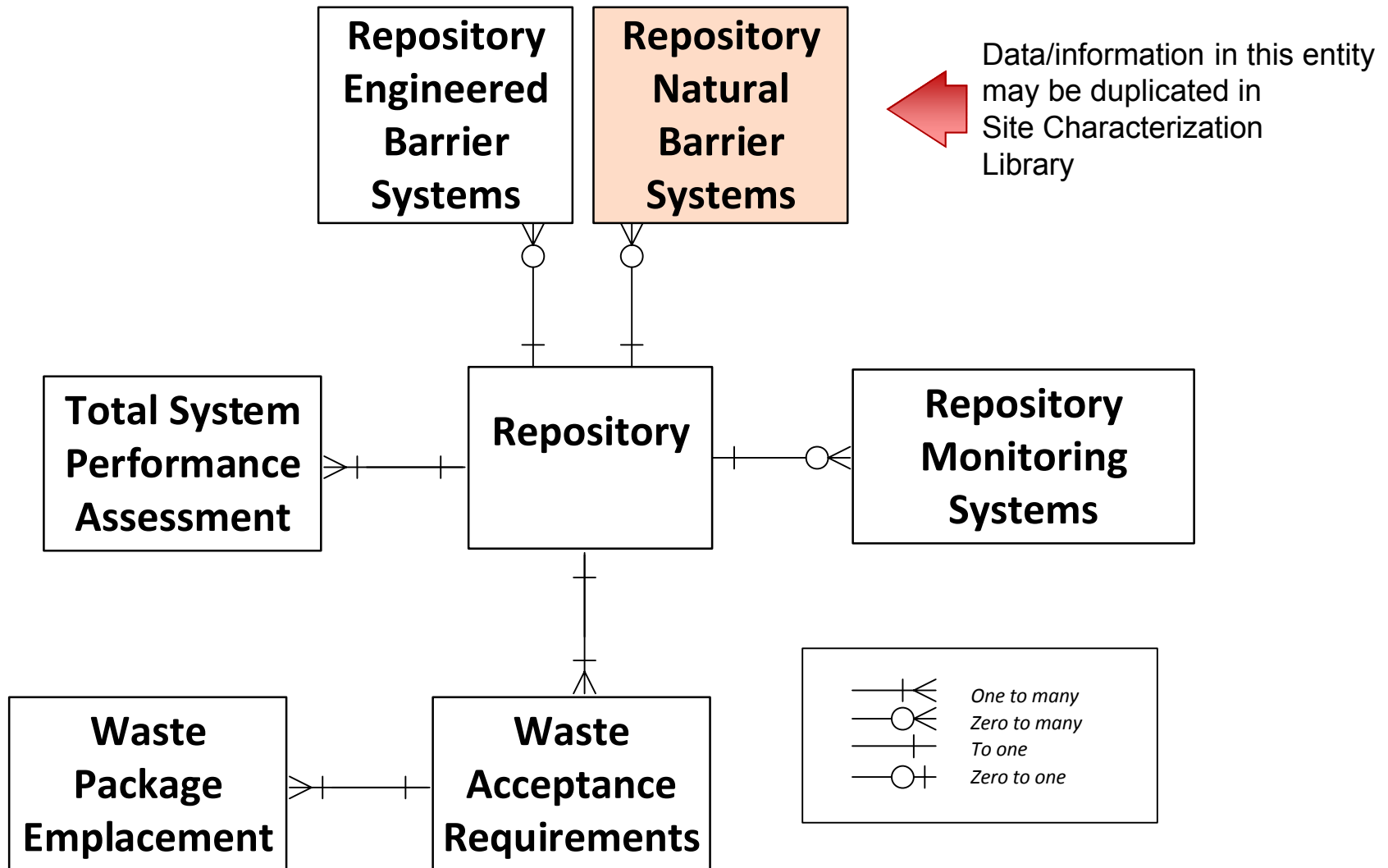
Above diagram from Alex Carter presentation 9/16

Repository CDM – Current Iteration



Repository CDM – Current Iteration

Plus Natural Barrier Systems



Repository CDM – Definitions

Entity definition: a thing that exists either physically or logically, capable of an independent existence that can be uniquely identified. It need not be of material existence.

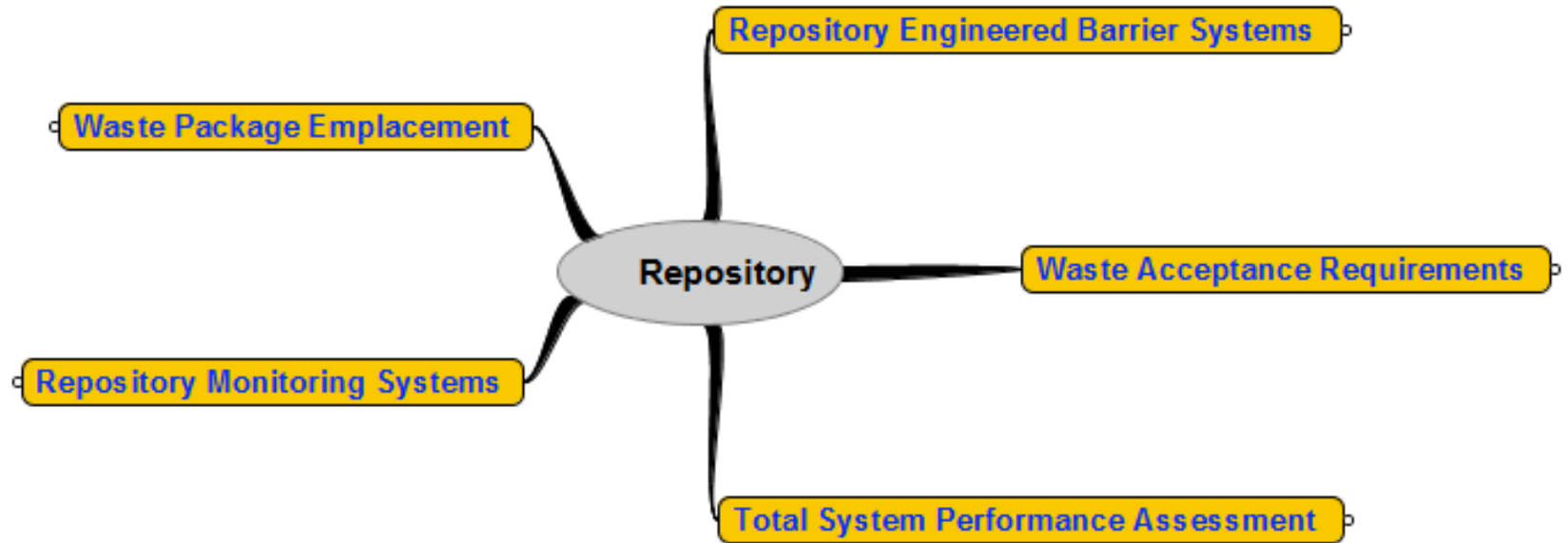
Entity	Definition
Total System Performance Assessment	Describes the method, structure, validation or confidence building, and application of a computational model for the performance of a repository system. Evaluates the ability of the repository to adequately isolate nuclear waste meeting standards for exposure following repository closure, in accordance with applicable regulatory requirements
Repository (at time of closure)	A nuclear facility where waste is emplaced for disposal. geological repository: A facility for radioactive waste disposal located underground (usually several hundred metres or more below the surface) in a stable geological formation to provide long term isolation of radionuclides from the biosphere. near surface repository: A facility for radioactive waste disposal located at or within a few tens of metres of the Earth's surface.
Repository Engineered Barrier System	Manufactured physical obstruction that contributes to the containment, retardation and/or isolation of (radioactive or chemical) contaminants present in the waste, that is part of the repository facility.

Repository CDM – Definitions (continued)

Entity	Definition
Repository Monitoring Systems	Systems and processes implemented in the repository to monitor any aspect of repository performance, including radionuclide release, chemical release and/or heat release to the near field, far field and the biosphere.
Waste Acceptance Requirements	Quantitative or qualitative criteria specified by the regulatory body, or specified by an operator and approved by the regulatory body, for radioactive waste to be accepted by the operator of a repository for disposal, or by the operator of a storage facility for storage. Waste acceptance requirements might include, for example, restrictions on the activity concentration or the total activity of particular radionuclides (or types of radionuclide) in the waste or requirements concerning the waste form or waste package. (Often referred to as the Waste Acceptance Criteria or WAC).
Waste Package Emplacement	Describes the way waste packages are placed in the repository for final disposal. Such placement may include vertical or horizontal placement in drifts, or placement in boreholes (for example).

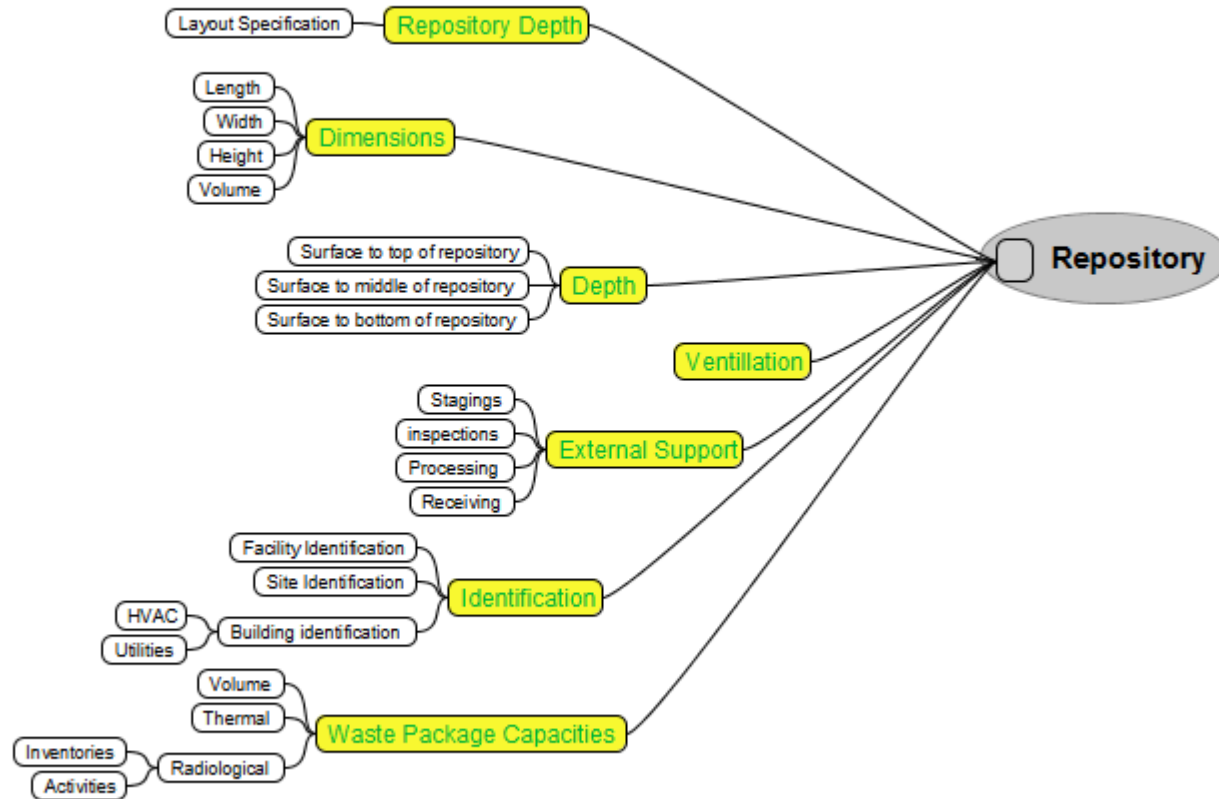
Current Iteration of Repository Mind Map

Level 1



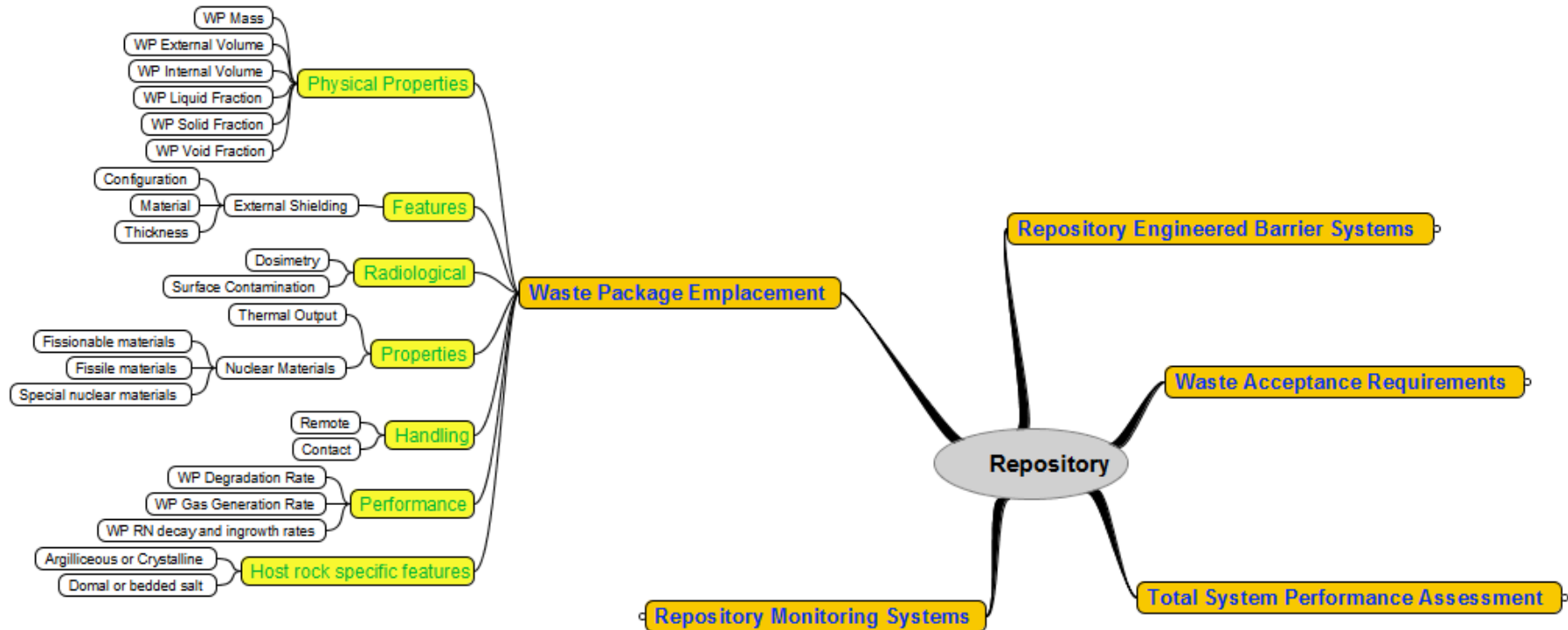
Current Iteration of Repository Mind Map

Level 2 – REPOSITORY ENTITY



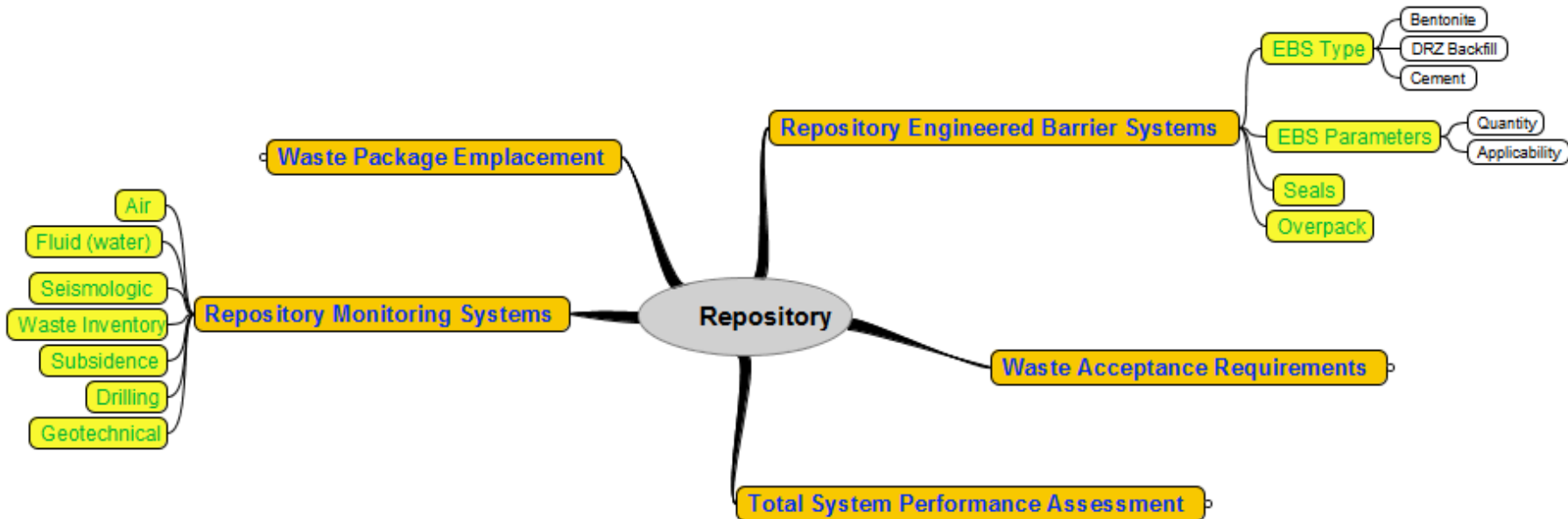
Current Iteration of Repository Mind Map

Level 2 – WASTE PACKAGE EMPLACEMENT ENTITY



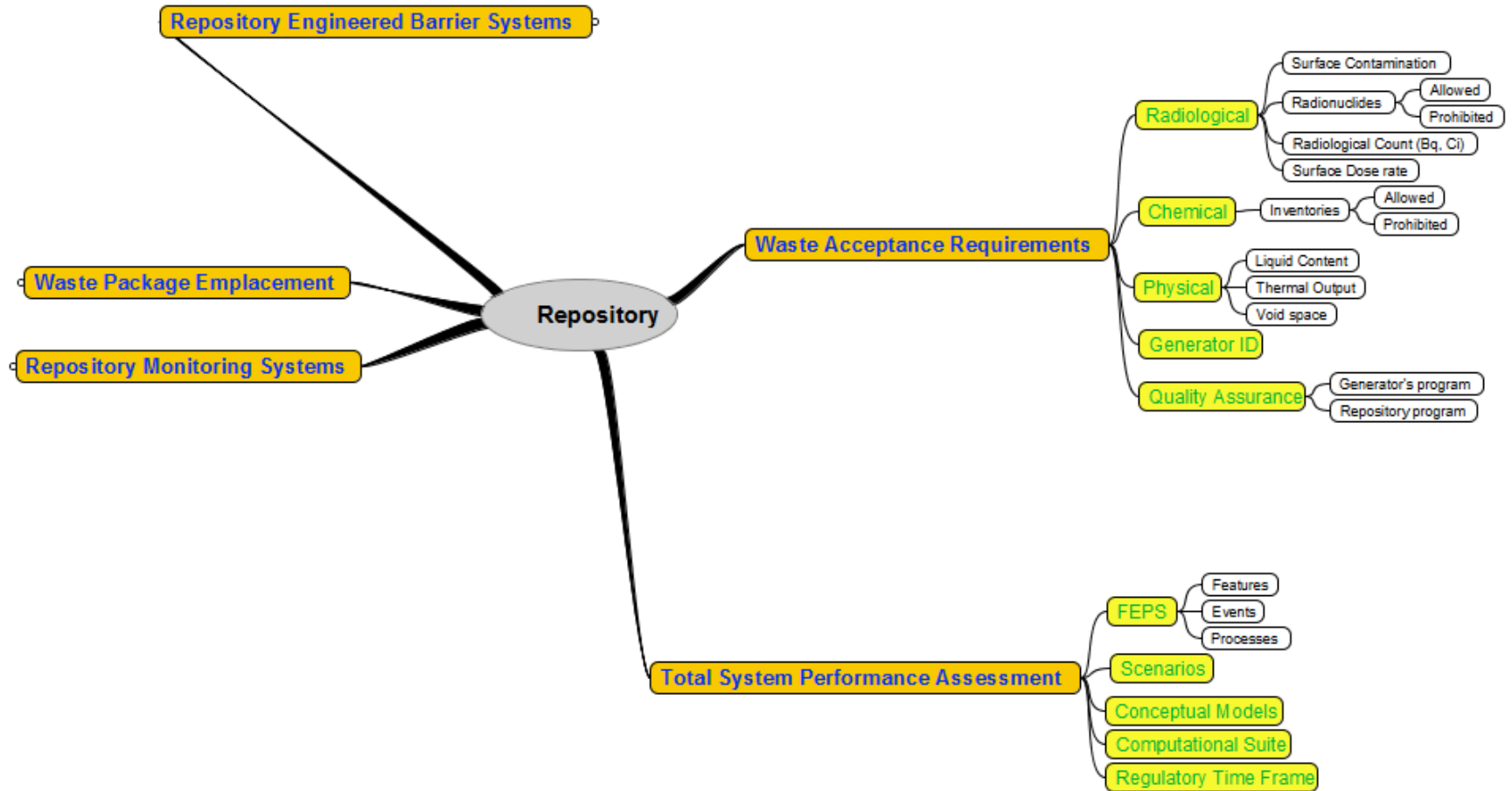
Current Iteration of Repository Mind Map

Level 2 – REPOSITORY MONITORING SYSTEMS & REPOSITORY ENGINEERED BARRIER SYSTEMS ENTITIES



Current Iteration of Repository Mind Map

Level 2 – WASTE ACCEPTANCE REQUIREMENTS & TOTAL SYSTEM PERFORMANCE ASSESSMENT ENTITIES



Discussion

- What do we need to do next?
 - Receive input from team for library
 - Discuss interfaces with Site Characterization, Waste Package and generally with RK&M activities
 - What about “duplicative” data in multiple libraries?
 - Complete the metadata information for entities and attributes