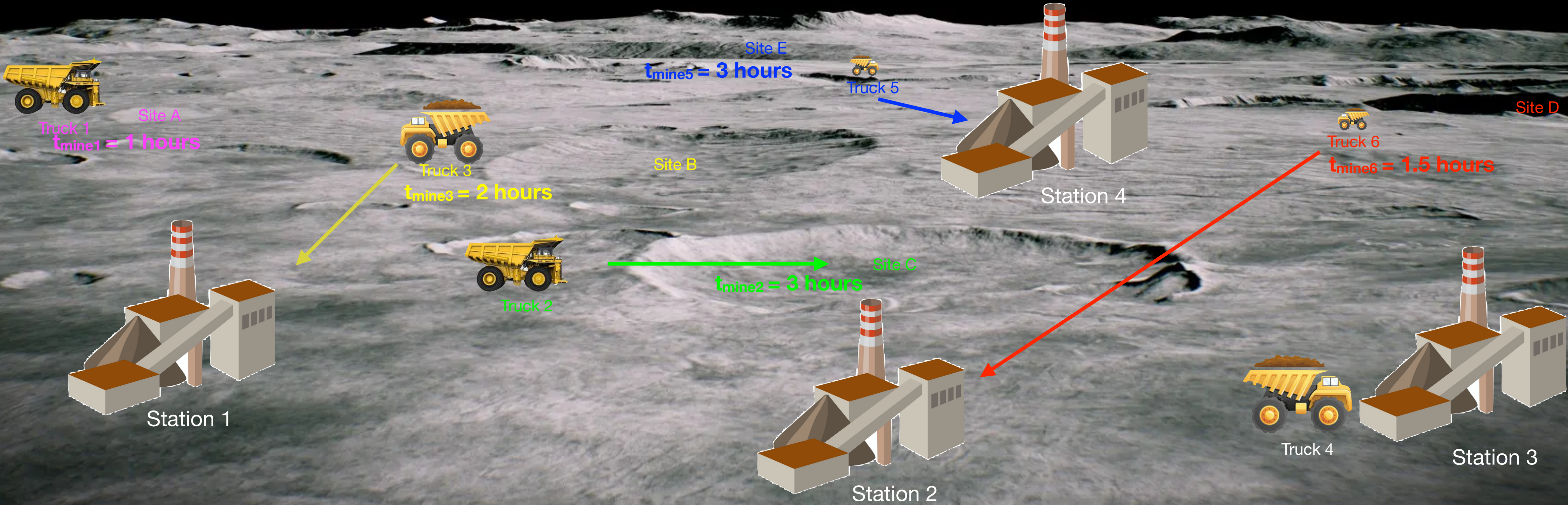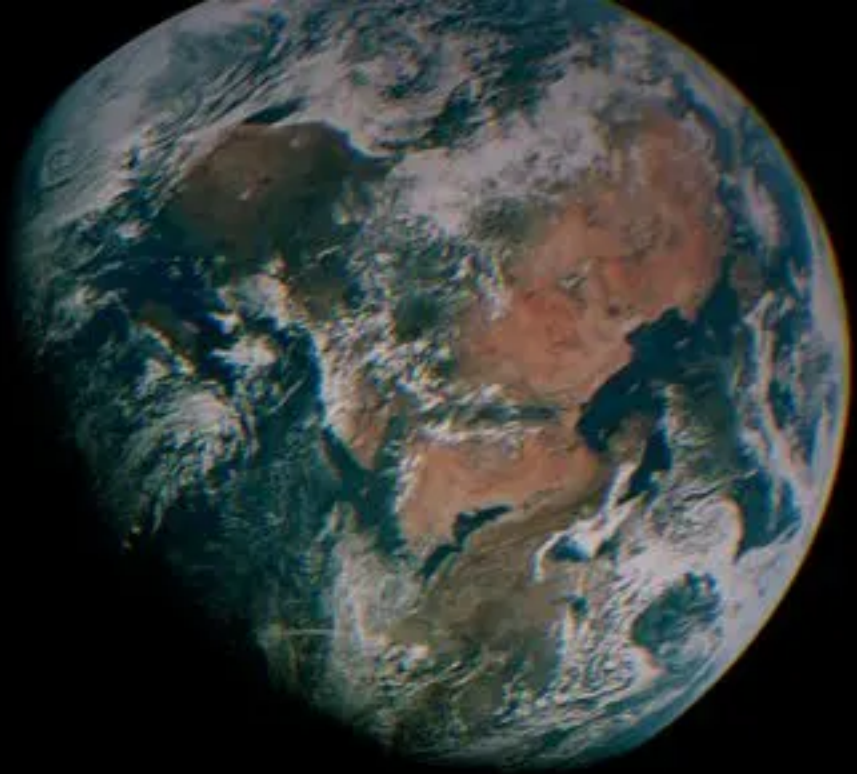# Vast Helium-3 Mining System

Summary and rough draft of my ideas

Todd Enger/May 28, 2024

Helium-3 Mining Operations

Assumptions

- n - Number of mining trucks

- m - Number of mining stations

- Mining duration takes from 1 - 5 hours

- Travel time between sites is 30 minutes

- Unloading mined He3 takes 5 minutes

- Trucks are assigned first available station

- If all stations are occupied, must wait at the station with the shortest wait time

- Simulation time runs for 72 hours

Class Structures
Mining_site { }

- Site_number (starts at 1)

- Site_location_lat (latitude in degrees)

- Site_location_long (longitude in degrees)

- Site_area (measured in km^2)

- Site_depth (max depth in km)

- Site_occupied (T if truck is present, F if absent)

Class Structures
Mining_truck { }

- Truck_number (starts at 1)

- Truck_full (T if truck is full, F if empty)

- Truck_mining_time (hours)

- Truck_travel_time (min)

- Truck_in_queue (T if truck is waiting for a station, F otherwise)

Class Structures
Mining_station { }

- Station_number (starts at 1)

- Station_full (T if station has a truck being unloaded, F if station is empty)

- Station_load_time (min)

Sim Functions
Mining_output { }

- Mining_output (int truck_number, int station_number, std::string site_name, float sim_time, int He3_mined, float mining_efficiency){ }