**Sand-Pit Information**

**Engineering controls:**

1. **Engine test area: has the engine test area been constructed? I want to see it prior to testing.**
2. **Control area: has this been constructed yet? I also want to see this prior to testing.**
3. The engine test area is already in place as it is the concrete cylinder near the construction materials. The static test fire rig will be placed inside to reduce the risk of fragment velocity if a CATO occurs. It takes around 10 minutes to attach the engine to the test fire stand, as they will be brought to the field separately.
4. The control area will be marked out with signs and tape. It will not be in direct line of sight of the test, being blocked by a mound of dirt. The electronics table controlling the test will be in the line of sight of the engine 200 feet away. The Key Man and the range officer will be located there, and will quickly move to a controlled, safe area when the test begins.

**Administrative controls:**

1. **Nitrous oxide: has this been purchased? It needs to be accounted for in UNHCEMS chemical inventory, and stored properly. Also, it needs to be transported properly: no regulator attached, valve cover on, secured/braced during transport. We need a procedure for this prior to transport, and the details will depend on the size of the cylinder and the vehicle used to transport it.**
2. **How do you handle the engine when it’s hot? Do you wait until it’s cool to move? How do you know when it’s cool?**
3. **Nobody will have line-of site on the engine during test, right? How will this be controlled?**
4. **How will you restrict access to the area during the engine test?**
5. **Create a pre-test checklist that the team uses to help ensure all items are completed prior to test.**
6. The nitrous oxide is basic car nitrous and is purchased at a local car shop and filled in our refillable tank. All components of the oxidizer flow assembly will be transported separately and attached on the field carefully with a lead supervising. The van we will be using to transport all the components will all be strapped down and secure to ensure no movement during the ride. We have not been accounting the oxidizer with UNHCEMS. We have been doing regular cold fire tests every weekend as they are not dangerous.
7. After the hot fire, assuming everything went well, we will need to follow a run-down time of around 10 minutes to ensure full burn and cool down. We will have heat resistant gloves to ensure that the handling of the engine is safe. We will also be able to tell the temperature of the surface of the engine in real time with our thermocouples.
8. Tape and markers will be used to ensure that there is no line of sight of the engine during the test. The safety officer will not say go to the test if this is not the case. The procedure checklist attached with this file goes over this timeline and procedure. We will have a live feed of the engine using a camera in the safe zone.
9. Ron told us that he and his men will run security and ensure that caution tape will be hung wherever needed with security details taking place throughout the day.
10. Pre-test checklist is included in the launch report. We will have many copies of this procedure on the field so everyone can follow along.

**Personal Protective equipment:**

1. **Plan for everyone on-site to wear safety glasses and ear muffs or ear plugs on when the test is in progress.**
2. We will have these materials for everyone at the field.

**Other:**

1. **Let’s perform sound-level monitoring during the test. My office has sound-level monitoring dosimeters we can use for this. I need a club representative who will take the lead on the sound-level monitoring. This will be simple, but we’d have to meet with the person for 30 minutes to review the procedure.**
2. **Please let me know which faculty in addition to Todd Gross are involved with this project, i.e. senior project advisors, etc. I want confirmation from them prior to engine test that you are ready from an engineering perspective.**
3. This sounds like a great idea. Please contact [twc1001@wildcats.unh.edu](mailto:twc1001@wildcats.unh.edu). He will be awaiting your email!
4. Todd Gross is our only advisor. Scott Campbell in the shop has been watching us closely on our design and manufacturing. He will probably be at the test. His email is [scott.campbell@unh.edu](mailto:scott.campbell@unh.edu)