Material Safety Data Sheet

SECTION 1: Product and Company identification

U.S. Geological Survey
Denver Federal Center
Building 20
Denver, CO, 80225

Phone Number 303-236-2454
Availability: 8:00AM – 5:00 PM MST

Product Name:	NU-LHT-2M
Issue Date	July 25, 2008

SECTION 2: Hazards Identification

Overview: The simulant material identified as NU-LHT-2M is an odorless powdered materials comprised of ground rock (anorthosite, norite) which contain aluminosilicates (Calcium-plagioclase, orthopyroxene, and clinopyroxene) along with major amounts of glass material. NU-LHT-2M also contains minor/trace amounts of ilmenite, β-tricalcium phosphate (whitlockite), pyrite, and fluor-apatite. NU-LHT-2M contains no asbestos and less than 2% quartz. Since NU-LHT-2M contains approximate 10% particle sizes under 25 micron it should be considered a nuisance dust and safe handling procedures per NIOSH 0500 nuisance dust classification should be followed to avoid symptoms of overexposure.

Caution: Excessive inhalation over long period may cause harmful irritation to eyes and respiratory tract. Use of a NIOSH approved mask for nuisance dust for prolonged exposure is recommended.

Hazard	Rating 0-4
Health	1 (slight hazard)
Reactivity	0 (no hazard)
Flammability	0 (no hazard)
Exposure	1 (slight hazard)
Storage	0 (No hazard)

Potential Health Effects:

Inhalation:	May cause irritation to respiratory track.
Skin Contact	No adverse effect expected
Eye Contact	May cause irritation
Chronic exposure	No studies have been conducted on long term exposure effects.
Pre-existing conditions:	Persons with impaired respirator function my be aggravated by nuisance dust.

See SECTION 11: Toxicological information

Potential Environmental Effects: None identified

Section 3: Compositional information

The major element composition listed below assumes a specific oxidation state and oxygen stoichiometry. It is important to realize that the compounds listed are representations of the chemical composition and do not represent the actual mineral composition of the simulant.

Major element	composition	CAS #	Wt, %	±
Silicon dioxide	SiO_2	14808-60-7	46.7	0.11
Aluminum Oxide	Al_2O_3	1344-28-1	24.4	0.07
Calcium Oxide	CaO	1305-78-8	13.6	0.05
Magnesium Oxide	MgO	1309-48-4	7.90	0.04
Iron Oxide	Fe_2O_3	1309-37-1	4.16	0.03
Sodium Dioxide	Na_2O	1313-59-3	1.26	0.02
Potassium Dioxide	K_2O	12136-45-7	0.08	<0.005
Manganese Dioxide	MnO	1344-43-0	0.07	<0.005
Phosphorous Pentoxide	P_2O_5	1314-56-3	0.15	0.01
Titanium dioxide	TiO2	13463-67-7	0.41	0.02

± One standard deviation

SECTION 4: First Aid Measures

Inhalation:	Move to fresh air. Get medical attention if symptoms occur
Skin Contact:	Wash exposed area with soap and water
Eye contact:	Immediately flush eyes with water for 15 minutes. Get medical attention if irritation persists

---

SECTION 5: Fire Fighting Measures

Fire:	Not a fire hazard
Explosion:	Not an explosion hazard
Fire extinguishing:	Use any means suitable for extinguishing surrounding fire.

SECTION 6: Accidental Release Measures

Personal Precautions:	Use personal protection recommended in Section 8
Methods for Containment:	No special instructions necessary
Methods for Clean-up	For spills, pick up and place in a suitable container for reclamation or disposal, Using a method that avoids

creating airborne dust.

SECTION 7: Handling and Storage

Handling:	When handling use care to minimize release of dust to the environment. Observe all warnings and precautions listed for this product
Storage:	Keep container closed when not in use and store in dry, ventilated area. Containers of the material may require caution when empty since they retain residual amount of dust material.

SECTION 8: Exposure Controls/Personal Protection

Airborne Exposure Limits: No ACGIH TLV exposure limits have bee determine for NU-LHT-2M, therefore maintain exposure limits for nuisance dust as defined by OSHA (15 mg/m^3) or ACGIH (10 mg.m^3).

Ventilation:	When working with large quantities of NU-LHT-2M, a system of local and/or general exhaust is recommended to minimize employee exposure. A NIOSH/MSHA approved dust respirator is recommended for long term exposure.
Skin protection	Wear Protective gloves as a precaution
Eye protection:	Use safety goggles as a precaution

SECTION 9: Physical and Chemical properties

Appearance:	NU-LHT-2M : a light gray material similar in texture to sand or dirt.
Odor:	None detected
Specific gravity	2.9 6/cm^3
Melting point	1200-1300ºC
Angle of internal Friction	45º
Cohesion	1.0 kPa

SECTION 10: Stability and Reactivity

Stability:	Stable under ordinary conditions of use and storage
Conditions to avoid:	None
Incompatible Materials	No information found

Hazardous Decomposition Products	No information found

SECTION 11: Toxicological Information

General comments: Inhalation of dust may irritate nose, throat, and lungs. Eye contact with solids may produce irritation. Use NIOSH nuisance dust masks or respirator and eye protection if long term exposure to dust component is likely.

The information contained in this document applies to this specific material as supplied. The information contained herein is believed to be accurate but is provided without warranty of any kind, express or implied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for his/her own particular use.