Date of Issue:
11 August 2017

SAFETY DATA SHEET

1. Substance and Source Identification

Product Identifier

SRM Number: 2780a
SRM Name: Hard Rock Mine Waste
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is primarily intended for use in the validation of chemical and instrumental methods of analysis of tungsten-bearing ores and other materials of similar matrix for elemental content. It can be used to validate value assignment of in-house reference materials. A unit of SRM 2780a consists of a bottle containing approximately 50 g of material of which 90 % passes a 150 µm (No. 100) sieve.

Company Information

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2. Hazards Identification

Classification

Physical Hazard:	Not classified.	
Health Hazard:	Carcinogenicity	Category 1
	Reproductive Toxicity	Category 1A
	STOT, Repeated Exposure	Category 1

Label Elements

Symbol:

Signal Word: DANGER

Hazard Statement(s):

H350	May cause cancer.
H360	May damage fertility or the unborn child.
H372	Causes damage to lungs through prolonged or repeated inhalation.

Precautionary Statement(s):

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear eye protection, protective gloves and clothing.
P308 + P313	If exposed or concerned: Get medical attention.
P405	Store locked up.
P501	Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Hard rock mine waste

Other Designations: Not applicable.

NOTE: Components are listed in compliance with OSHA's 29 CFR 1910.1200. The health and physical hazard information provided in this SDS is for quartz and lead, individual components of the material. For actual values, see the NIST Certificate of Analysis.

Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Hard rock mine waste	not applicable	not applicable	100
Individual Component(s)			
Silica, as crystalline quartz	14808-60-7	238-878-4	35
Lead	7439-92-1	231-100-4	0.7

4. FIRST AID MEASURES

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: If a large amount is swallowed, get medical attention.

Most Important Symptoms/Effects, Acute and Delayed: May cause irritation, nausea, vomiting, metallic taste, thirst, a burning sensation in the mouth and throat, salivation, abdominal pain with severe colic. Delayed effects include cancer, birth defects, and reproductive effects.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. Avoid generating dust. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Use extinguishing media appropriate for surrounding fire.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1 Fire = 0 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Any accumulated material on surfaces should be removed and properly disposed of. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Collect spilled material in appropriate container for disposal. Keep out of water supplies and sewers.

7. HANDLING AND STORAGE

Safe Handling Precautions: Minimize dust generation and accumulation on surfaces. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances (see Section 10, "Stability and Reactivity").

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits: No occupational exposure limits have been established for hard rock mine waste. The following exposure limits are for the individual components.

Exposure Limits			
Component(s)	**OSHA (PEL)**	**ACGIH (TLV)**	**NIOSH (REL)**
Silica, crystalline quartz	(30)/(%SiO2 + 2) mg/m^3 TWA (total dust) (250)/(%SiO2 + 5) mppcf TWA (respirable fraction) (10)/(%SiO2 + 2) mg/m^3 (respirable fraction)	0.025 mg/m^3 TWA (respirable fraction)	0.05 mg/m^3 TWA (respirable dust) 50 mg/m^3 IDLH (respirable dust)
Lead	50 µg/m^3 TWA 30 µg/m^3 (Action Level, See 29 CFR 1910.1025)	0.05 mg/m^3 TWA	0.050 mg/m^3 TWA 100 mg/m^3 IDLH

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:	**Silica, as crystalline quartz (35 % of this SRM)**	**Lead (0.7 % of this SRM)**
Appearance (physical state, color, etc.):	colorless to white, amorphous powder	white to grey disk
Molecular Formula:	SiO_2	Pb
Molar Mass (g/mol):	60.09	207.20
Odor:	odorless	not available
Odor threshold:	not available	not available
pH:	not applicable	not available
Evaporation rate:	not applicable	not available
Melting point/freezing point (ºC):	1610 (2930 ºF)	328 (622 ºF)
Specific Gravity (water=1):	2.6 to 2.7	11.3
Vapor Pressure (mmHg):	0 at 20 ºC	1.3 mmHg at 970 °C
Vapor Density (air = 1):	not applicable	not available
Viscosity (cP):	not applicable	not available
Solubility(ies):	insoluble in water; soluble in hydrofluoric acid	almost insoluble in water; soluble in nitric acid and hot concentrated sulfuric acid
Partition coefficient (n-octanol/water):	not available	not available
Particle Size:	< 150 µm	< 150 µm

Thermal Stability Properties:	Silica, as crystalline quartz (35 % of this SRM)	Lead (0.7 % of this SRM)
Autoignition Temperature (ºC):	not applicable	not applicable
Thermal Decomposition (ºC):	not available	not applicable
Initial boiling point and boiling range:	2230 ºC (4046 ºF)	1740 ºC (3164 ºF)
Explosive Limits, LEL (Volume %):	not applicable	not applicable
Explosive Limits, UEL (Volume %):	not applicable	not applicable
Flash Point (ºC):	not applicable	not applicable
Flammability (solid, gas):	not applicable	not applicable

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: Oxidizing materials, halogens, combustible materials, peroxides, metals, metal carbide, and acids.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce oxides of lead.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation _____ Skin X Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: If inhaled, generated dust may cause irritation, fatigue, weakness, anorexia, anemia, jaundice, and encephalopathy.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Acute exposure to fine particles containing respirable quartz may result irritation; chronic exposure may result in irritation, chest pain, weight loss, difficulty breathing, digestive disorders, bluish skin color, lung damage, cancer, and death. Inhalation of particles containing lead may cause irritation, nausea, vomiting, kidney damage, liver damage. Chronic exposure to lead may result in an accumulation in body tissues and exert adverse effects on the blood, nervous system, heart, endocrine and immune systems, kidneys, and reproduction.

Skin Contact: May cause mechanical irritation. Prolonged or repeated exposure may cause dermatitis.

Eye Contact: May cause mechanical irritation.

Ingestion: Short term inhalation of lead may cause irritation, nausea, vomiting, kidney damage, liver damage. Prolonged exposure to lead may result in an accumulation in body tissues and exert adverse effects on the blood, nervous system, heart, endocrine and immune systems, kidneys, and reproduction.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified; mixture does not meet classification toxicity ranges.
Category 4, oral and inhalation for lead.

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye Damage/Irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Category 1B

Listed as a Carcinogen/Potential Carcinogen X Yes _____ No

Lead is listed as reasonably anticipated to be a human carcinogen per NTP. IARC lists inorganic lead in Group 2A (probably carcinogenic to humans). Silica, crystalline quartz is listed as Group 1, *carcinogenic to humans* by IARC, *known human carcinogen* (respirable size) by NTP, and is not listed by OSHA as a designated carcinogen.

Reproductive Toxicity: Category 1A; lead crosses the placenta and may affect the fetus causing birth defects, mental retardation, behavioral disorders, and death during the first year of childhood.

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Category 1, cumulative exposure to quartz may result in reduced lung capacity and silicosis.

Aspiration Hazard: Not classified; no data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Lead, Carp (*Cyprinus carpio*), LC50: 0.44 mg/L (96 h, semi-static)
Trout (*Oncorhynchus mykiss*), LC50: 1.17 mg/L (96 h, flow-through)

Persistence and Degradability: No data available.

Bioaccumulative Potential: No bioaccumulation expected for calcium oxide.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. Lead Hazardous Waste Number(s): D008; subject to U.S. EPA 40 CFR 262 for concentrations at or above the regulatory level of 5.0 mg/L.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Lead, 10 lbs (4.54 kg) final RQ – no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 μm.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Lead, 0.1 % for supplier notification limit and de minimis concentration (when contained in stainless steel, brass, or bronze).

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	No.
CHRONIC HEALTH:	Yes.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:

California Proposition 65:

WARNING! This product contains chemicals known to the state of California to cause cancer (quartz and lead) and reproductive/developmental effects (lead).

U.S. TSCA Inventory: Quartz and lead are listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 11 August 2017

Sources: ChemADVISOR, Inc., SDS *Quartz*, 09 December 2015.

ChemADVISOR, Inc., SDS *Lead*, 09 December 2015.

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transport Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.