

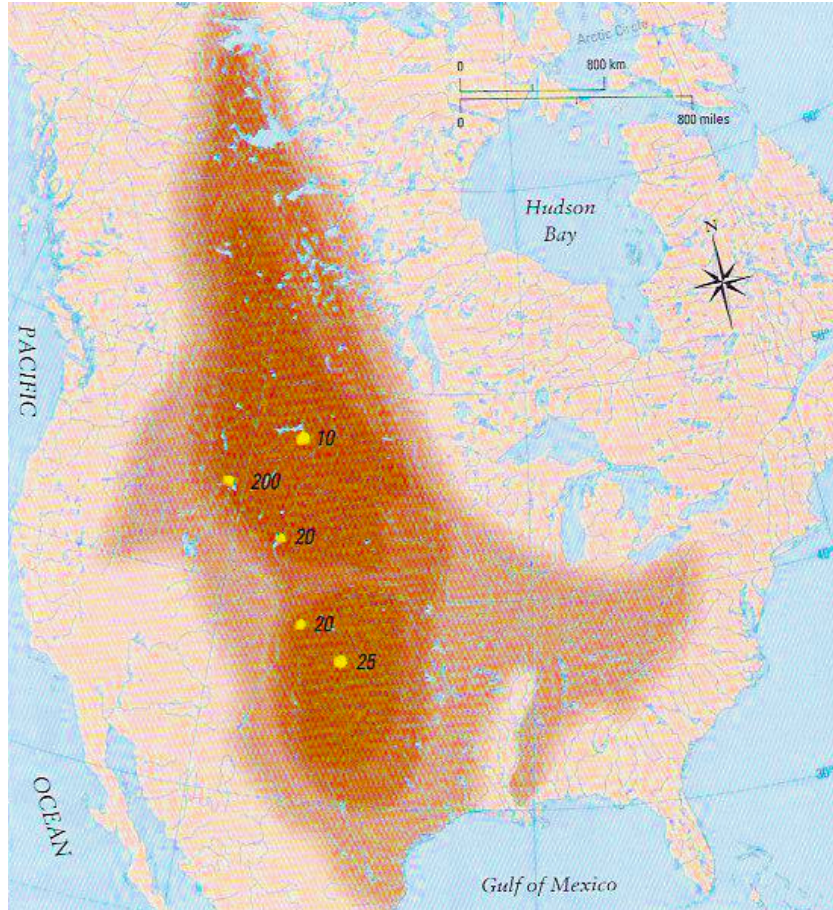
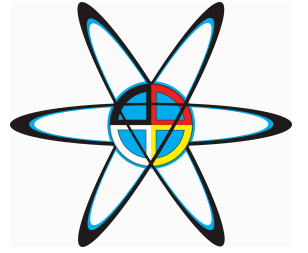
Zeolite Mining on the Pine Ridge Reservation 2019

Some Scientific Background

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www.giways.org

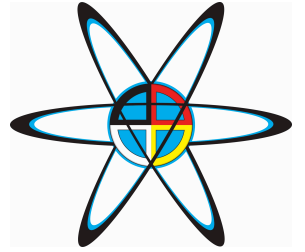
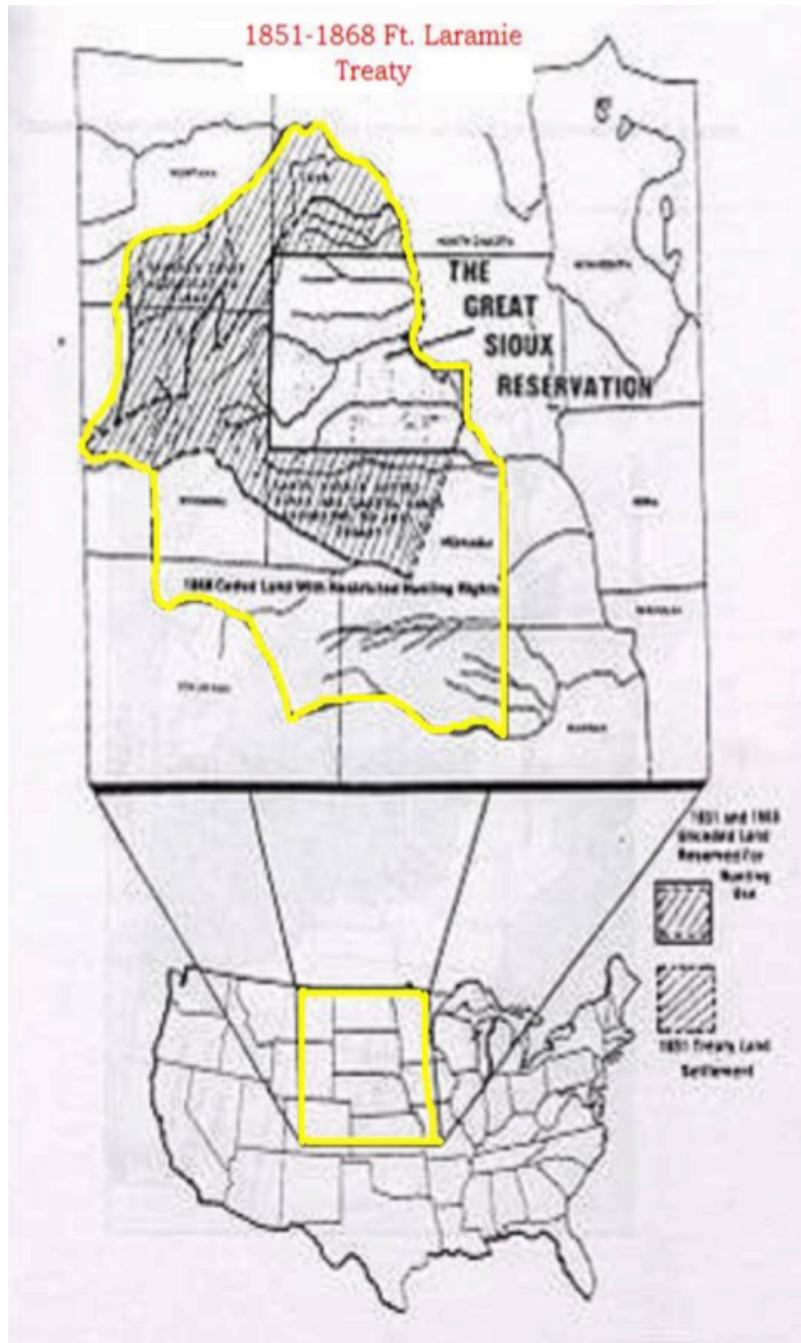
Unci Maka Kiciyapi (Taking Care of Mother Earth)

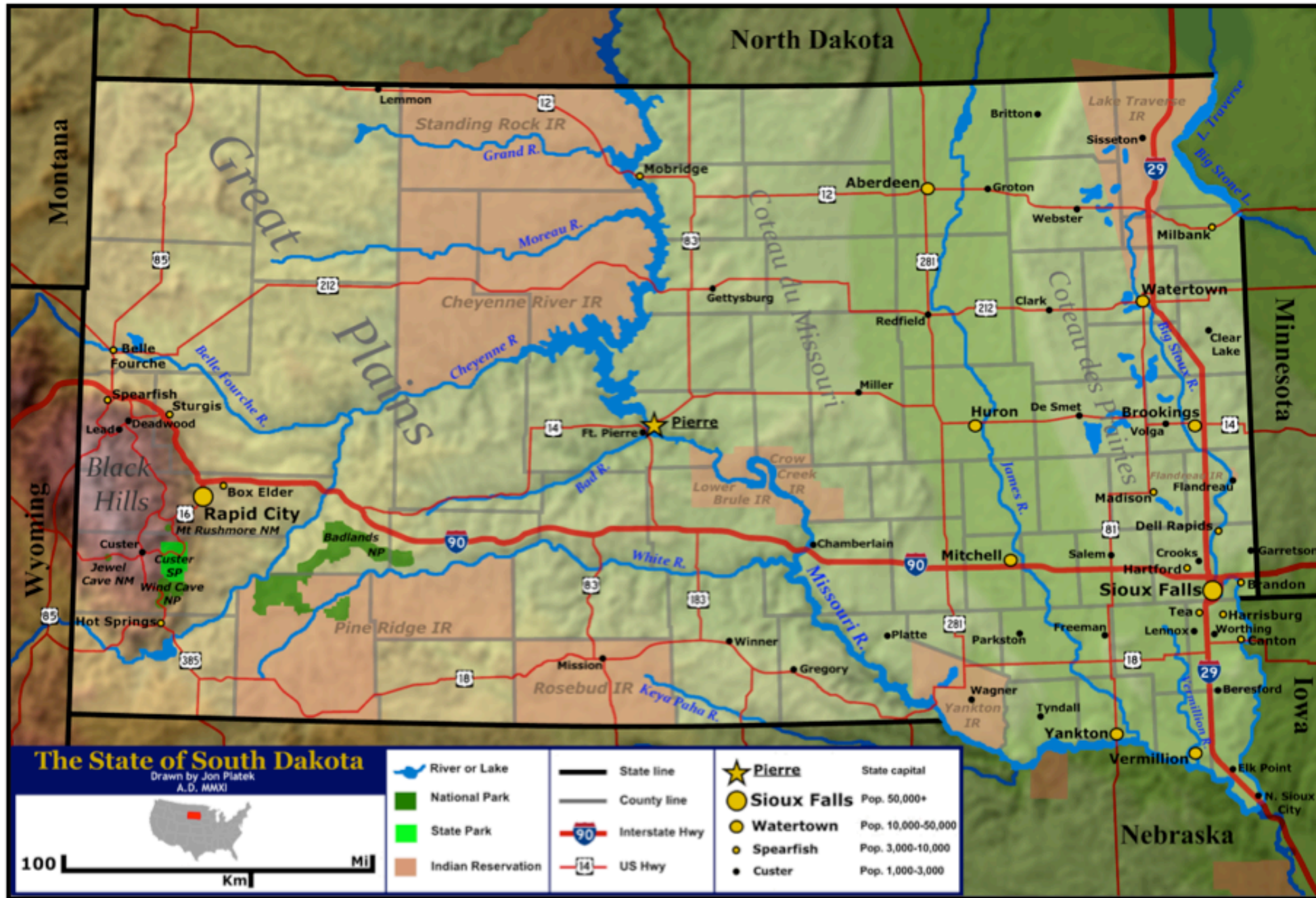
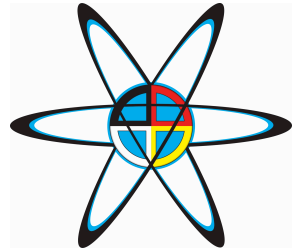


- Why are we talking about the effects of Zeolite Mining.
- What is Zeolite?
- How is it formed?
- Who should know about this?

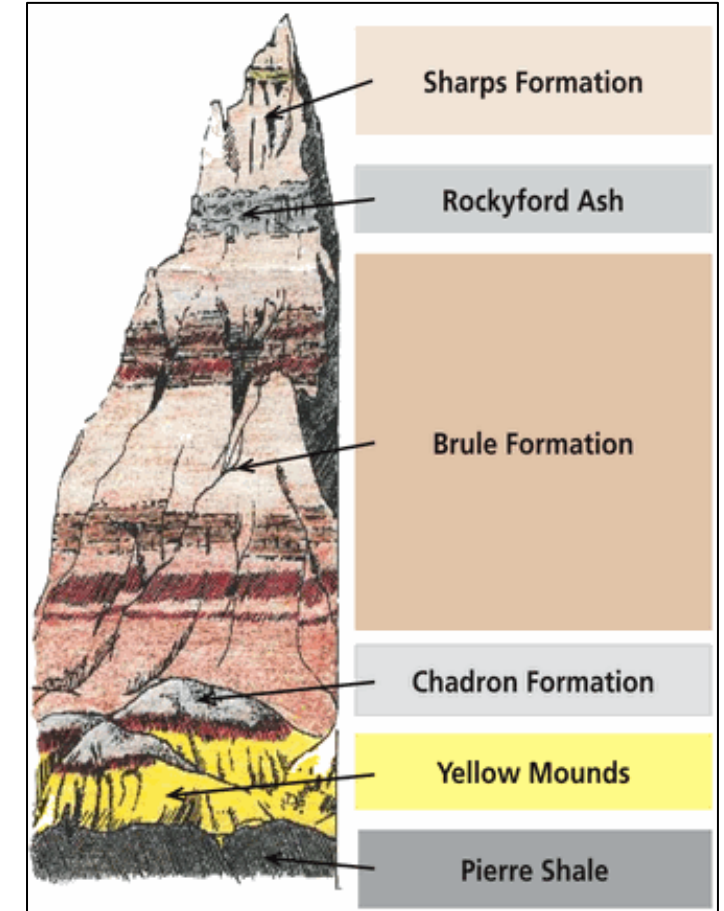
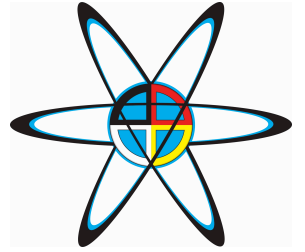
Proposed site for Zeolite Mining

- Within the Boundries of the 1851 & 1868 Fort Laramie Treaty Territories
- Pine Ridge Indian Reservation
- Badlands, South Dakota

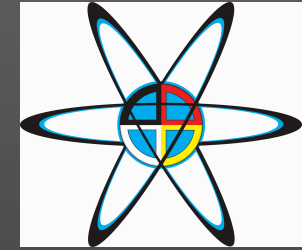
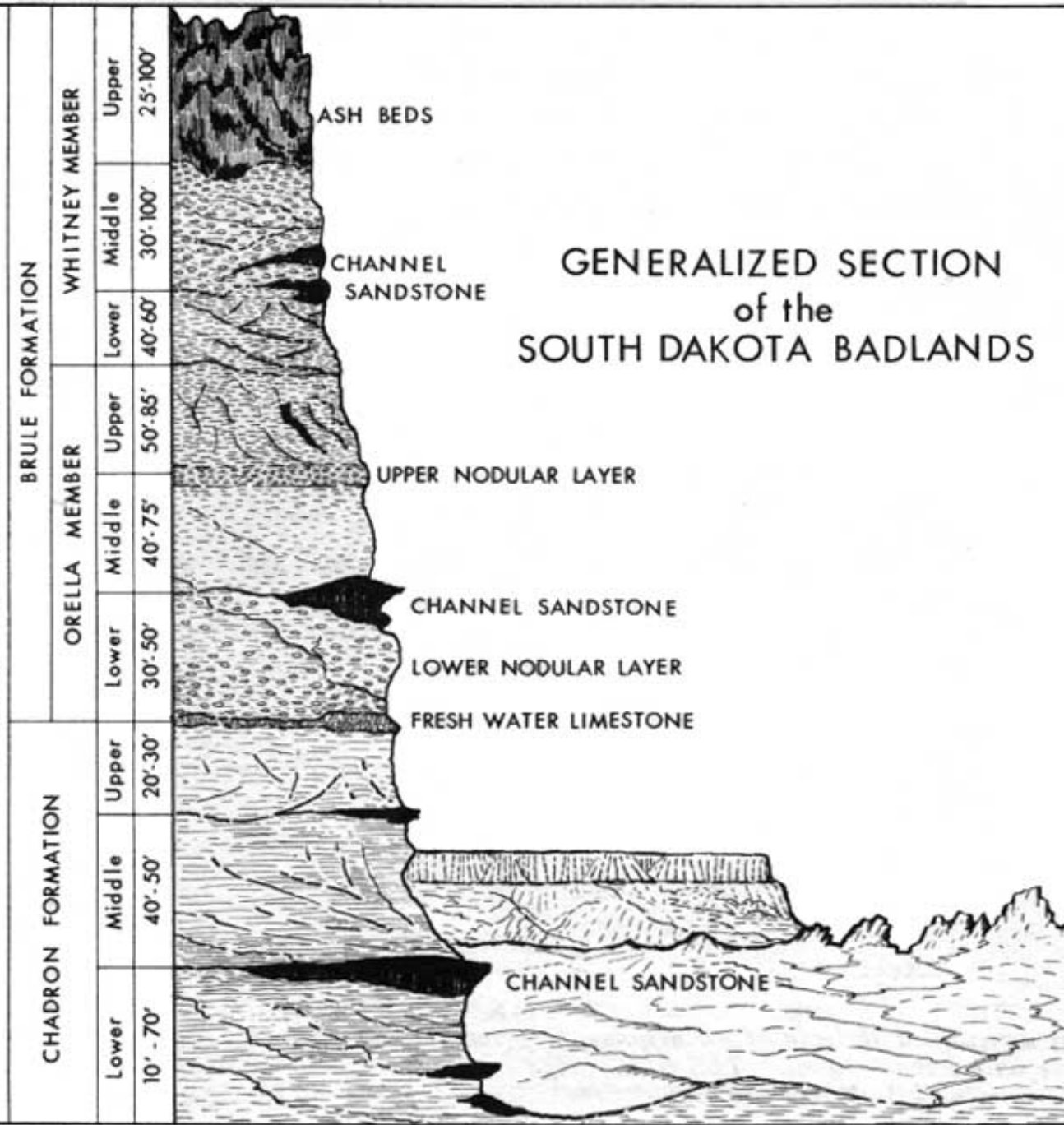




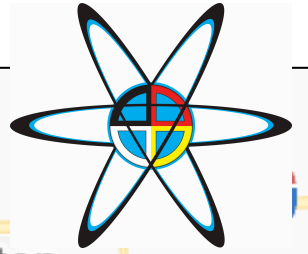
Geological History of the Area



OLIGOCENE EPOCH



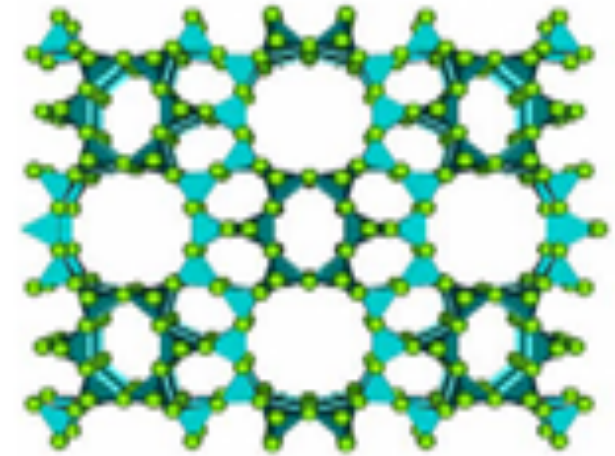
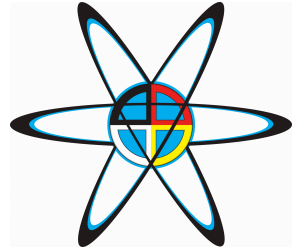
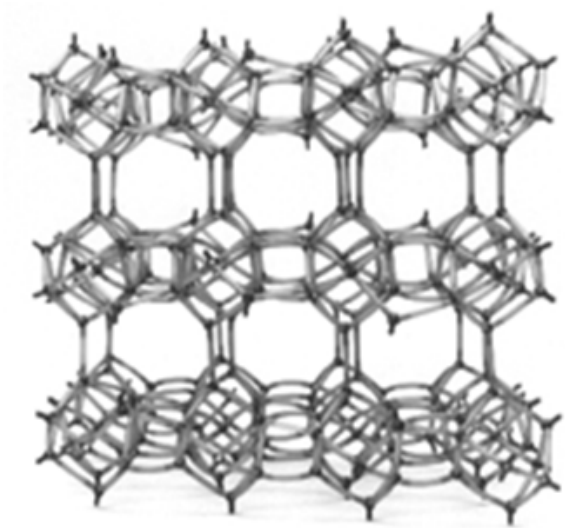
Geological Abundance of Zeolites



What are Zeolites ?

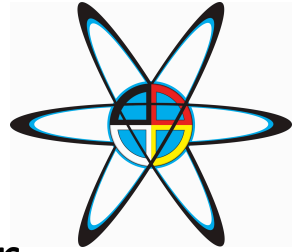
Zeolites are three-dimensional crystal structures from the elements aluminum, oxygen, silicon alkali or alkaline-Earth metals (Na, K, Mg) water molecules trapped in the gaps between them

Zeolites have regular openings in them of fixed size, which let small molecules pass straight through but trap larger ones that's wh they are referred to as **molecular sieves**
The differently sized holes represent channels and cages



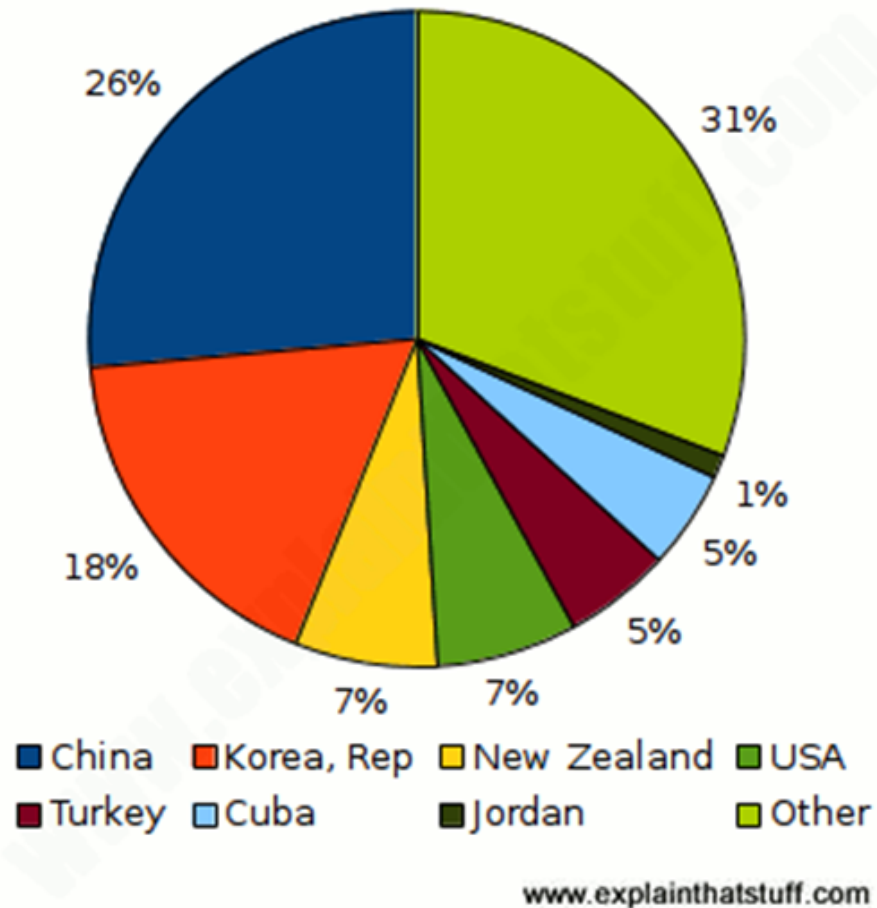
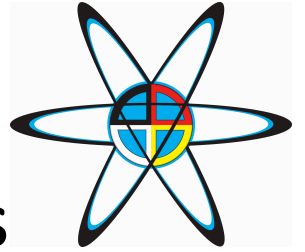
(Image courtesy of Geoffrey Price, University of Tulsa)

Zeolites are used for:



- Purification of Water and Treatment of Industrial Wastewater
- Natural fertilization
- Cat litter odor elimination
- Molecular sieves to reduce levels of heavy metals
- Soil decontamination of radiocaesium, radiostrontium..
- Catalysts in petroleum cracking
- Human skin tissue development
- Zeolite coating as selective membranes, chemical sensors, components of microelectronic devices

According to US Geological Survey, there are 40 naturally occurring zeolites, forming in both volcanic and sedimentary rocks



Estimated world mine production for 2017

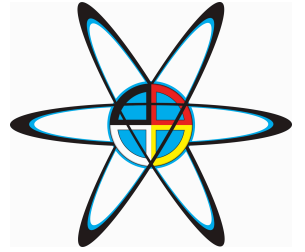
More than 150 synthetic zeolites

Synthetic zeolites are manufactured in very precise and uniform sizes

they are made a certain size

to trap molecules of a certain (smaller) size inside them.

Natural Zeolites found within the boundaries of the Pine Ridge Reservation



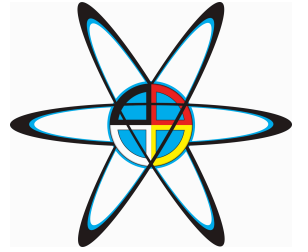
Clinoptilolite



Erionite



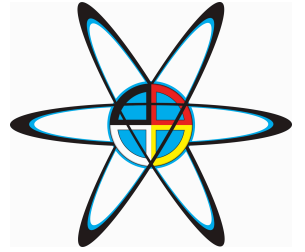
Clinoptilolite



- It can reduce **cell viability** and **DNA synthesis** and increase **cell apoptosis**
- In humans it can lead to kidney tissue damage
- Eaten by chicken, it can lead to an **inflammatory response** in their intestines
- What can happen to local birds?



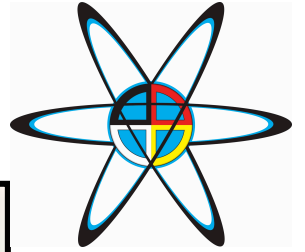
Erionite



- **Erionite** forms brittle wool-like fibrous masses that have similar properties to **asbestos** and can cause **lung cancer** and **malignant mesothelioma**
- It has been classified as **carcinogenic mineral for the human health** according to epidemiological data and has been listed as Class I by the International Agency for Research on Cancer (ARC)
- Animal tests suggest that **erionite** is up to **800 times** more likely to cause tumors than chrysotile asbestos
200 times more likely to cause tumors than crocidolite asbestos
- In some studies of rats exposed to erionite fibers, **malignant mesothelioma** developed in **100 % of cases**

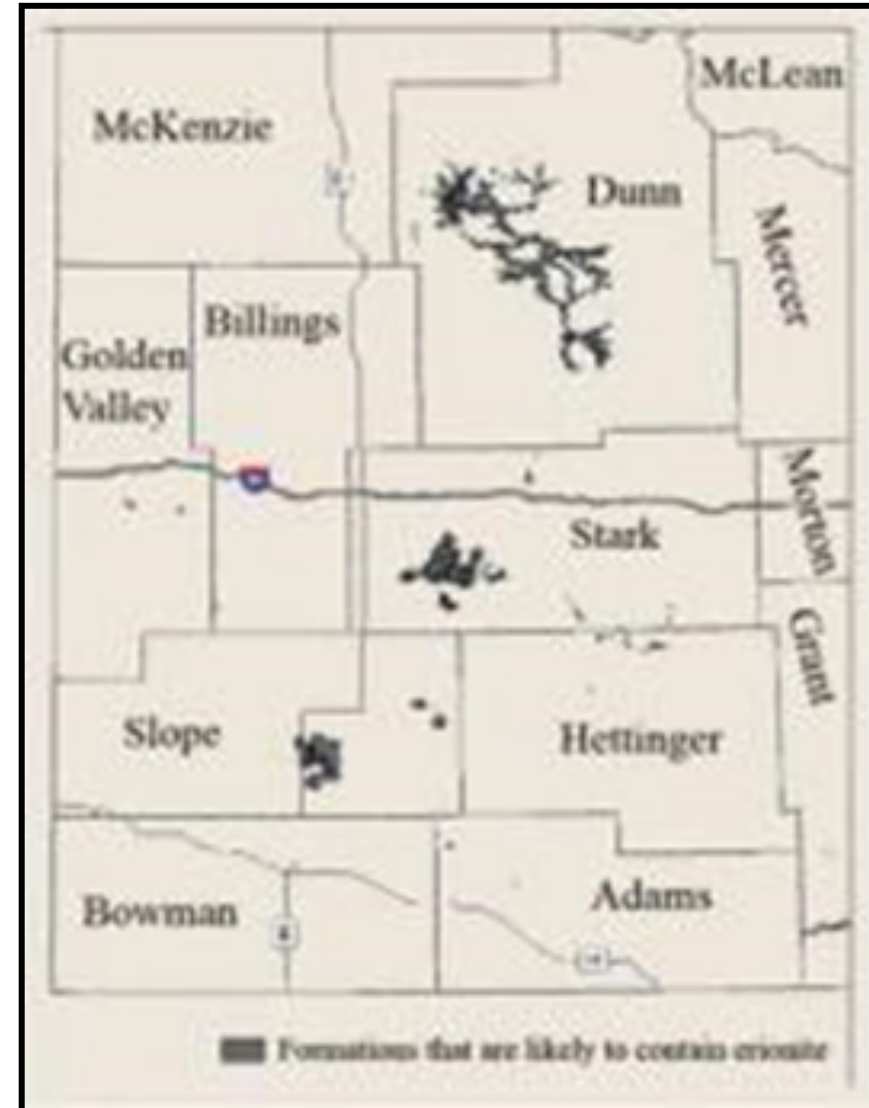


Erionite

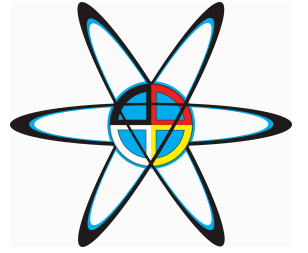


Dunn County, ND:

- For roughly 30 years, **erionite** was crushed and spread on nearly 500 kilometers of roads, on playgrounds, baseball fields, parking lots and even flower beds
- A new study shows that concentrations of airborne **erionite** in **Dunn County**, ND, equal or exceed those in Boyali, a Turkish village with a **6.25% mesothelioma-related mortality rate**



Environmental Destruction through Zeolite Mining



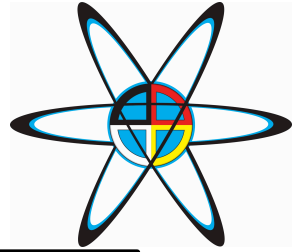
Before Mining



After Mining



Vegetation and animal population change after mining procedures

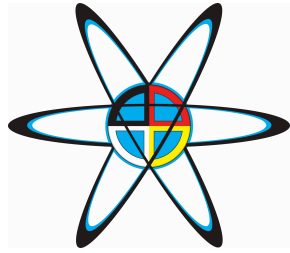


Zeolites store water in the ground

- Red Cedars use this water and will not grow back after the zeolite has been taken from the ground
- Birds, that nest in cedars and animals that consume the cedar berries disappear



On June 12th, 2015



the **Tetuwan Oyate Treaty Council** discussed zeolite mining on the Pine Ridge Indian Reservation by a North Dakota based company discussed the issue of called **Dakota Land Trust**.

The Dakota Land Trust had bypassed the **Oglala Sioux Tribal Legal and Regulation Process** by originally obtaining a **gravel mining permit** from the State of South Dakota for land within the borders of the Pine Ridge Reservation.

Instead of mining gravel the company began mining for zeolite illegally !

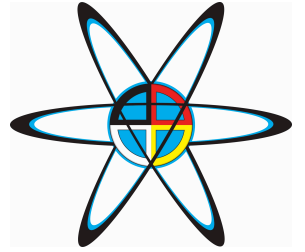
Once tribal officials and citizens were made aware of the mine, actions were taken to shut it down.

The **Treaty Council** found all representatives of the **Dakota Land Trust** company, to be in violations of **Article 1 of the 1868 Ft. Laramie Treaty** and guilty of violations and depredations against **“Mother Earth.”**

Therefore, they were banned from the reservation and barred from ever reentering!



The Treaty Council also voted in favor of a decision against any type of zeolite mining on the reservation.



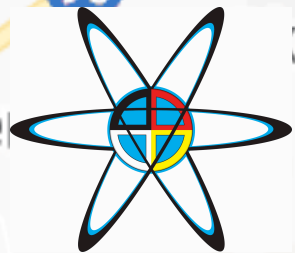
What is going on Today?

- February 2019:
- PINE RIDGE –The Oglala Sioux Tribe's Economic Business & Development Committee has voted to approve a contract with a contractor to begin pursuing the extraction and sale of zeolite deposits on the Oglala Lakota Nation reservation land
- The company involved is

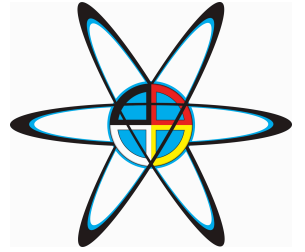
TransCanada – the big oil pipeline builder -
in need of the zeolites for all the oil spills along their pipeline route



Badlands
National Park



What can you do?

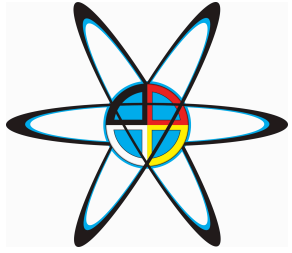


- Spread the information you got today, so people are informed
- Contact everybody from your family who is in a decision making position and tell them your concerns
- Put up flyers and signs against any form of mining on the reservation

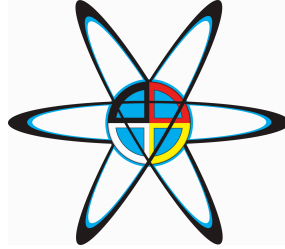
What else can you think of?



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Pilamiya ye!

Questions & Discussion.