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NUCLEAR WASTE
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DES DÉCHETS
NUCLÉAIRES



What is Used Nuclear Fuel?

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Senior Engineer, Used Fuel Safety Assessment

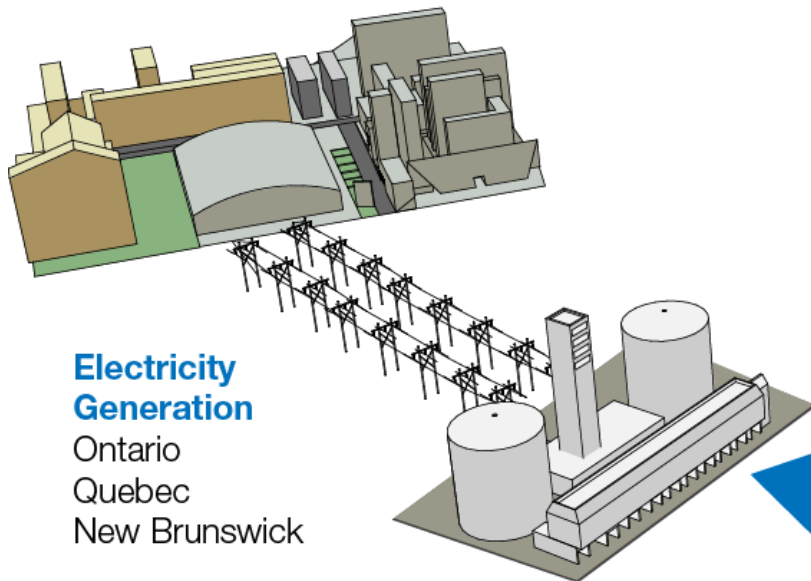
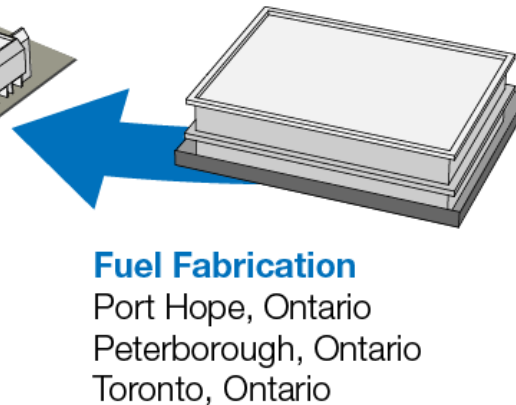
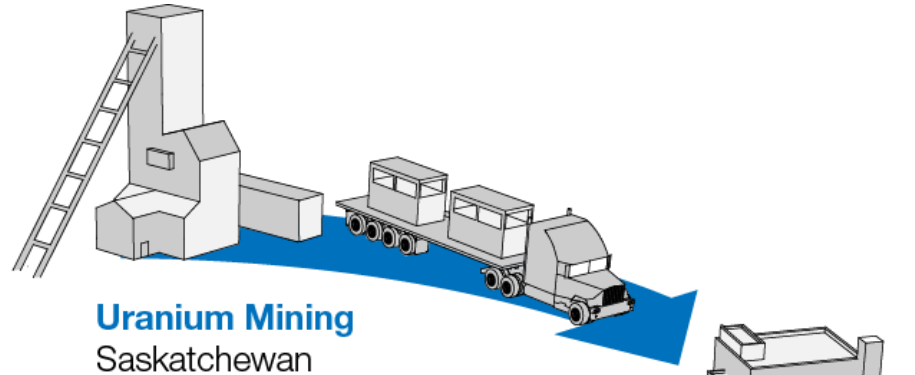
What is Used Nuclear Fuel?

Discussion Topics

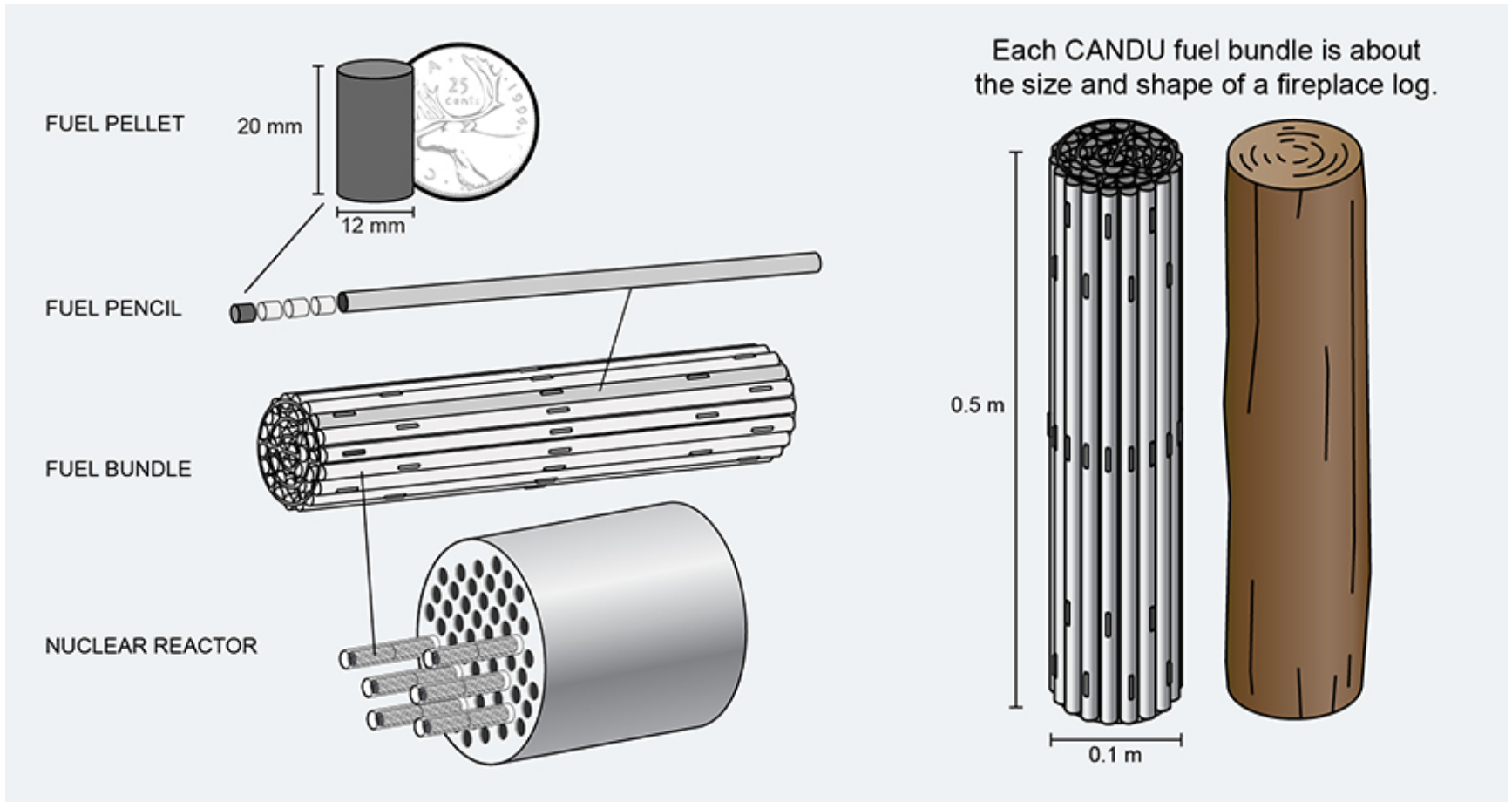
- How is it made?
- What does it look like?
- What is it used for?
- Why is it hazardous?
- Where is it now?



Nuclear Fuel Cycle in Canada



CANDU Fuel

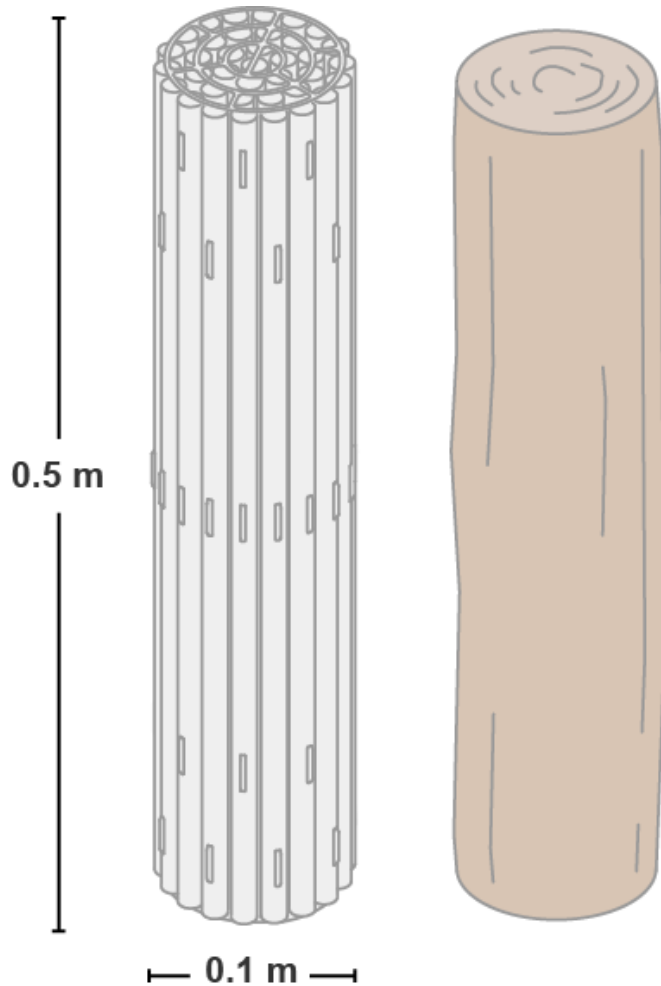


CANDU Reactor

- About 5,000 fuel bundles per reactor
- Each bundle stays in reactor for about 15 to 18 months



CANDU Fuel



One fuel bundle . . .

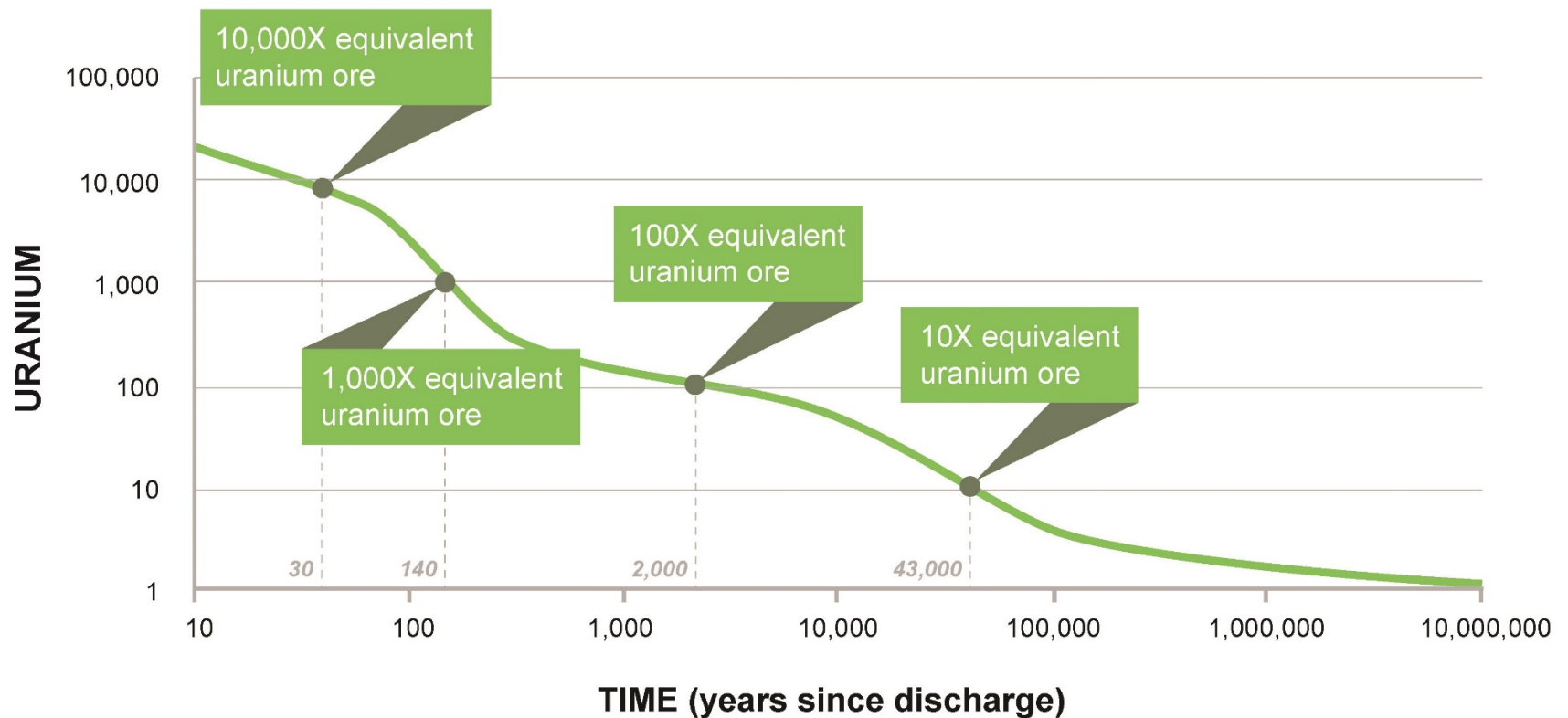
- Is about the size of a fireplace log
- Can power 100 homes for a year
- Contains about 20 kg uranium

Used nuclear fuel is a potential health risk for a very long time.

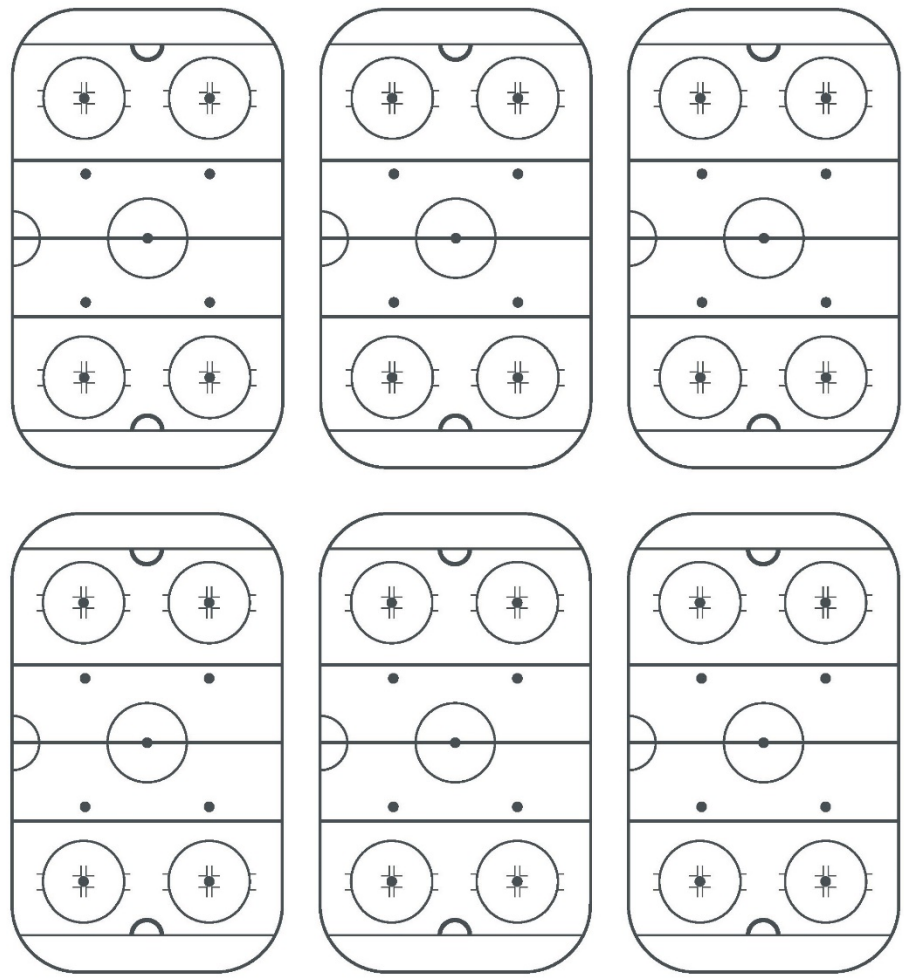
It must be safely contained and isolated from people and the environment, essentially indefinitely.

Used Nuclear Fuel is Radioactive

USED FUEL RADIOACTIVITY RELATIVE TO EQUIVALENT AMOUNT OF URANIUM



~2.8 million



As of June 30, 2017, there are about 2.8 million used nuclear fuel bundles in Canada.



<1%

MANITOBA

~90%

ONTARIO

1

~5%

QUEBEC

NEW BRUNSWICK

~5%

7

2

3

4

5

6

Interim Storage Facilities

1. Whiteshell Laboratories, Manitoba
2. Bruce Nuclear Generating Station, Ontario
3. Pickering Nuclear Generating Station, Ontario
4. Darlington Nuclear Generating Station, Ontario
5. Chalk River Laboratories, Ontario
6. Gentilly Nuclear Generating Station, Quebec
7. Point Lepreau Nuclear Generating Station, New Brunswick





Wet Storage

- Used nuclear fuel initially very hot and highly radioactive
- Stored in water pools for cooling and shielding
- Pool water kept separate from other water
- After 7 to 10 years, used fuel cool enough to move to dry storage



326

326

416

416

425

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423

421

419

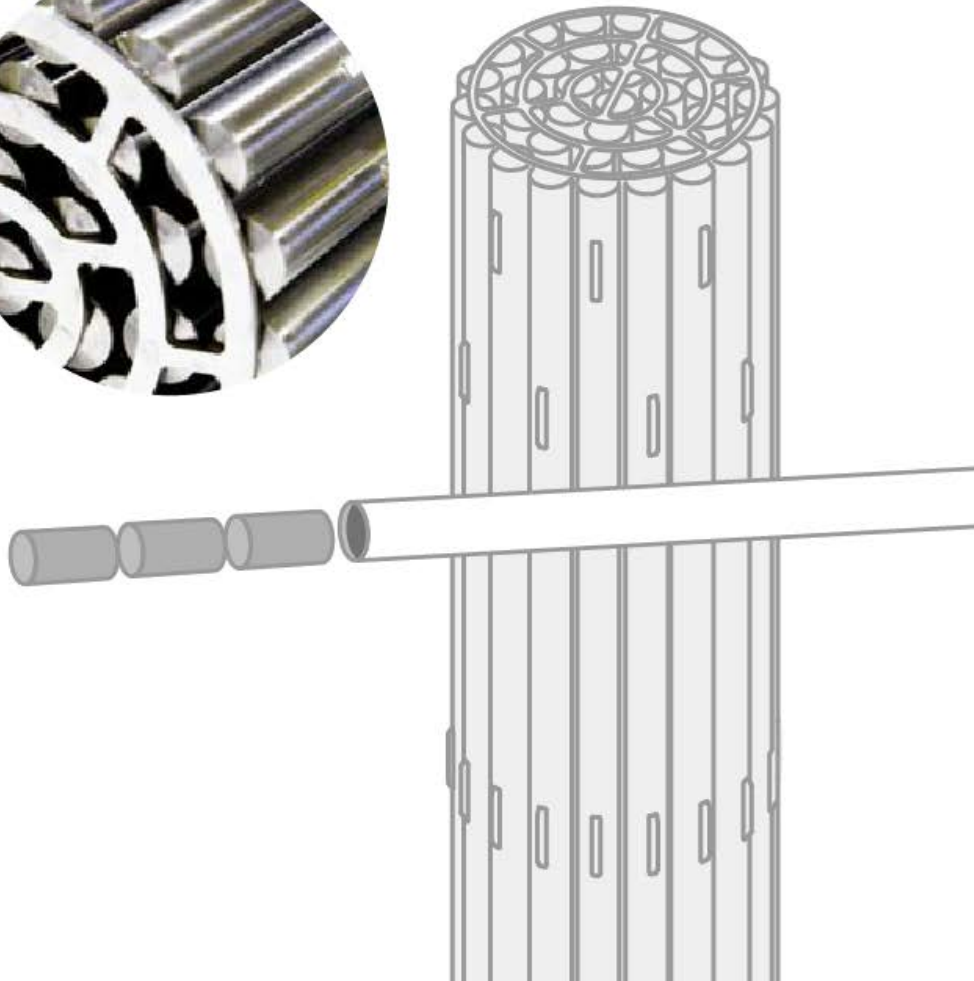
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417

Dry Storage

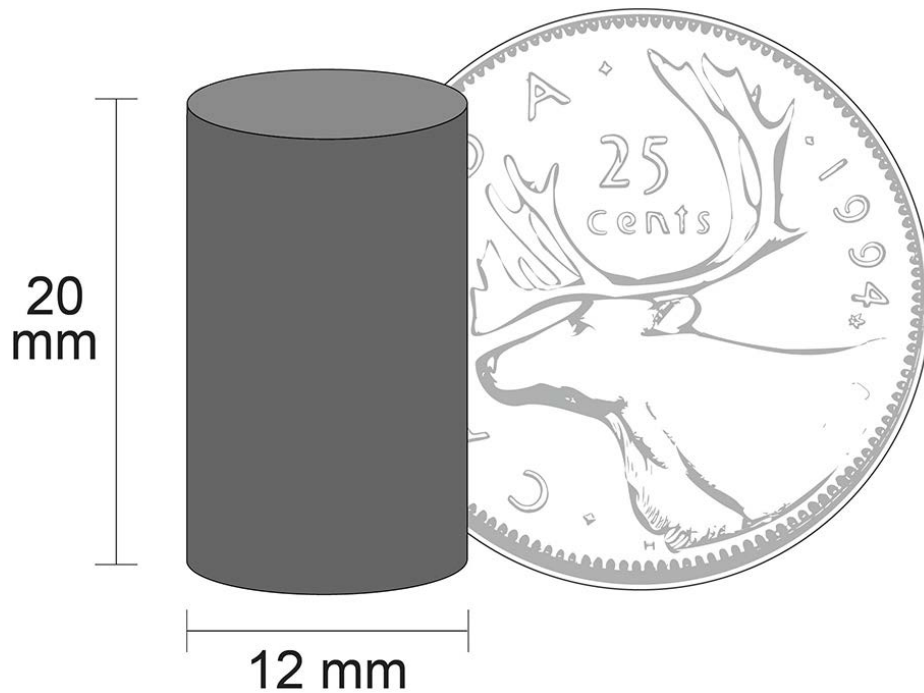


Fuel Bundle



- **Used fuel pellets are held in sealed tubes**
- **Zircaloy metal is extremely strong**
- **Zircaloy metal is corrosion-resistant**

Fuel Pellet



- High density ceramic
- Extremely durable
- Does not readily dissolve



Thank you