

Introduction to

Uranium on the Navajo Nation –

History, Exposure Pathways & Health Effects

Diné Bikéyahgi Łeetsoh Hólónígíí –

Nát'ąą' Náháne', Bée'ádaáh & Ats'íís Yeiinít'jįh

Ha'át'íish óolyé łeetsoh (uranium)?

- Natural element – t'áá bił hahodilyaa
- Metal – béésh át'é
- Radioactive – bits'ádziil ihodidoołt'ihígíi bee hóló



Łeetsoh

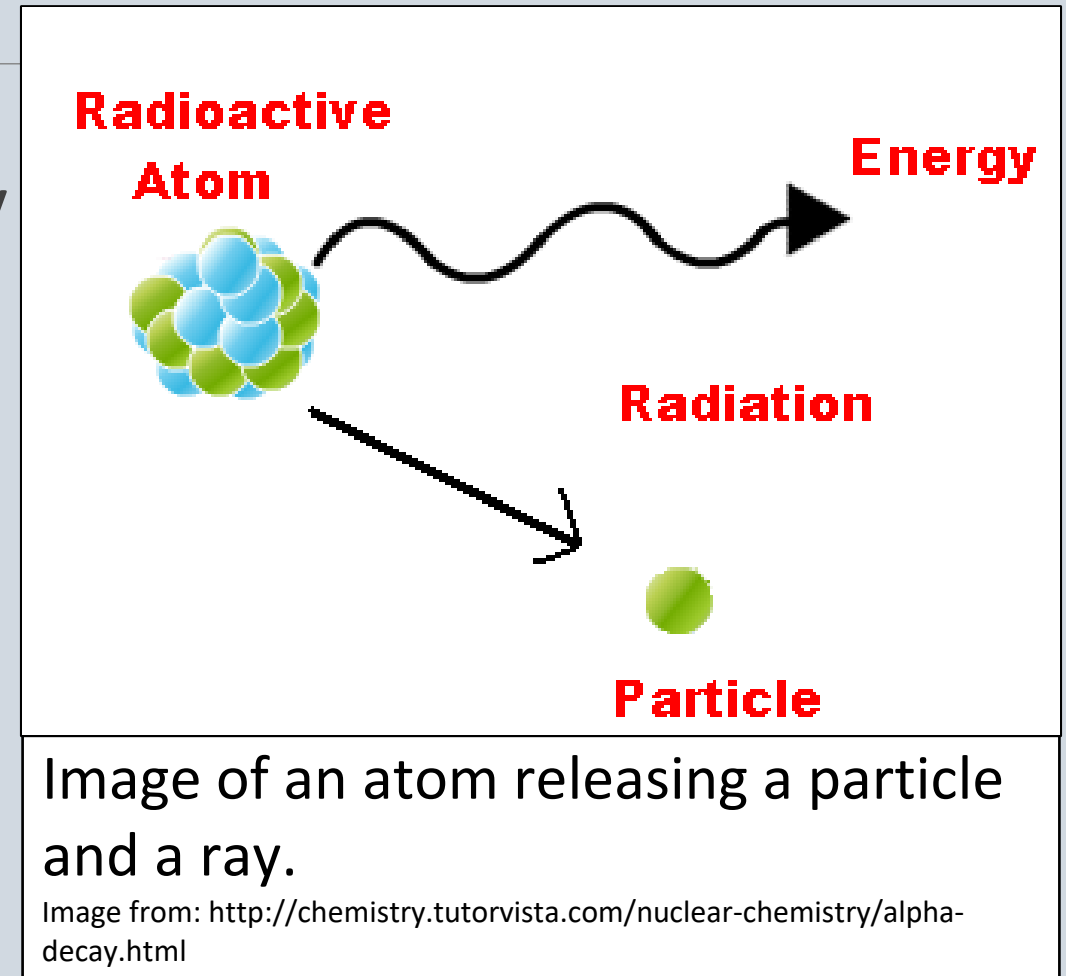
https://en.wikipedia.org/wiki/Uranium_in_the_environment

Ha'át'íish óolyé bits'ádziil (radioactivity)?

Radioactivity is the release of energy and particles – bits'áháldóóh dóo yidiyiichíid

Radioactivity is invisible – doo yit'íj da

Radioactivity can be detected with a machine – bee hahxidil'íjhii hóló



What else gives off radioactivity?

Ha'át'íish ałdó' bits'ádziił dahóló?



Jjhonaa'éi



Nát'oh



Łóód doo nádziihii
baąh é'élneehgo



Tsé & béesh bee ál'ini



Łeetsoh Be'ak'a'
Diildqohgo



Hashk'aan & Brazildéé'
neeshch'ii

Some types of radioactive releases – ats'ádziil ał'ąą ádaat'éii

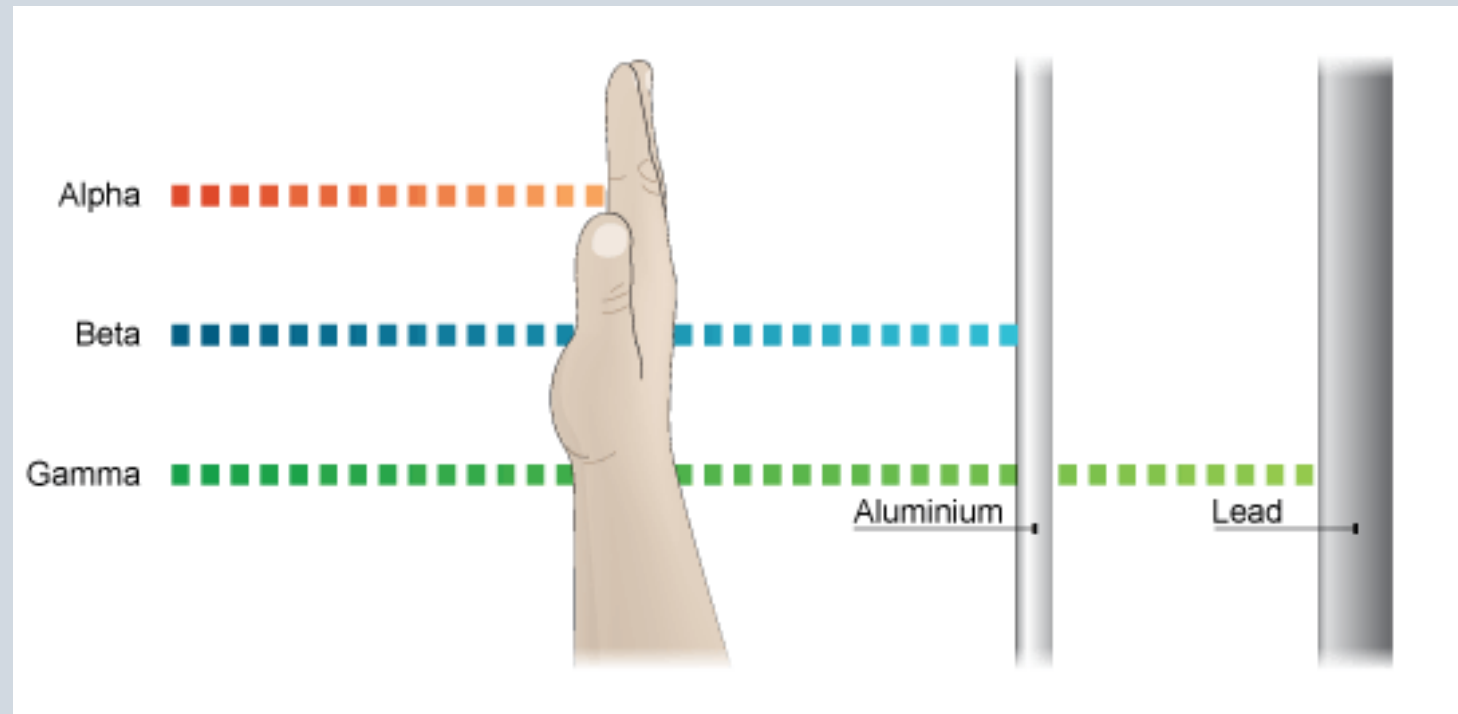


Image from:

http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway/energy_resources/nuclear_radiationsrev1.shtml

Radioactive contamination – ats'ádziil bi'ídiich'aat

Alpha éí doodago
teetsoh bits'ádziil éí
díkwíígóó shǫ́i a'ąą
át'éego ats'íis
biihwiileeh.

Ajiłnah éí doodago
bił ajidzih

Ats'íiskáá' łóód
biníkáá góne'

Ats'íis bii' naazléii
łá' ałyóí yii' aha'
ádaat'jjh

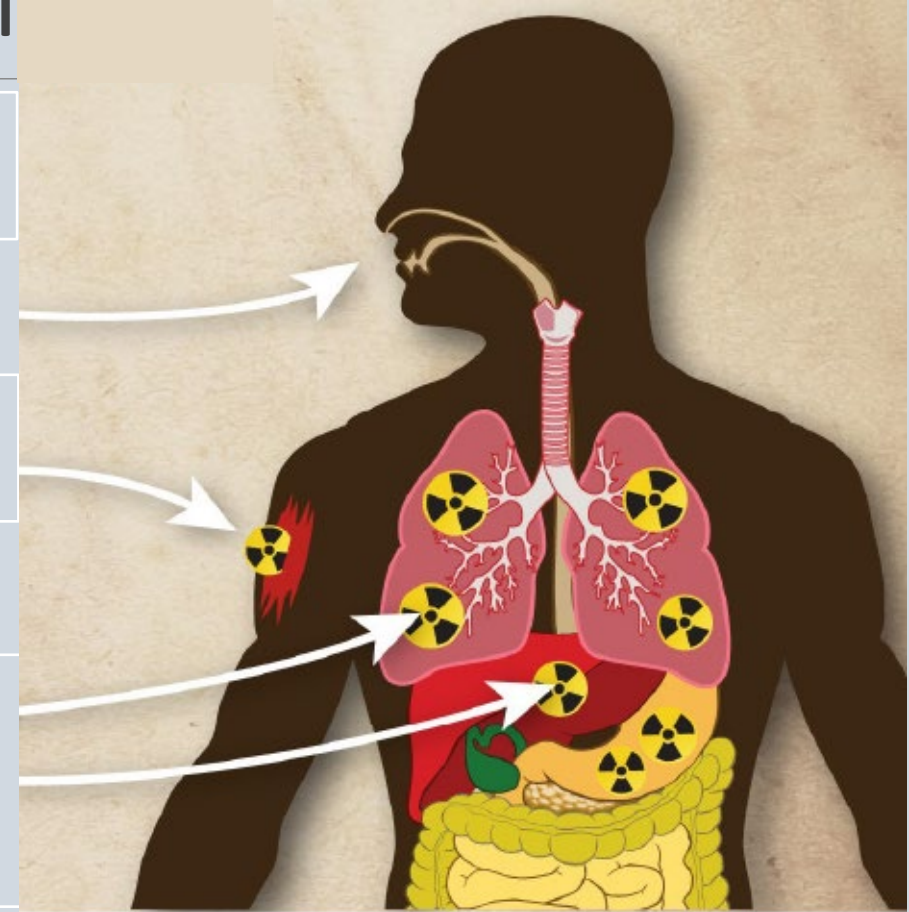


Image from CDC Radiation Studies Branch

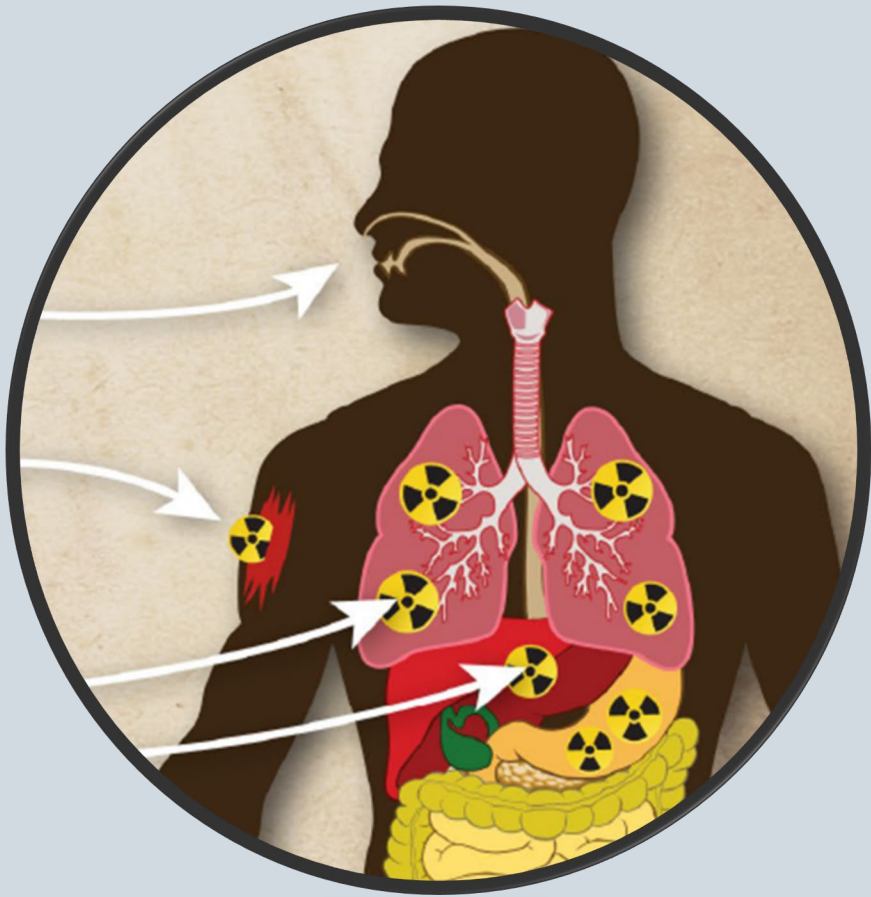
https://emergency.cdc.gov/radiation/pdf/infographic_contamination_versus_exposure.pdf

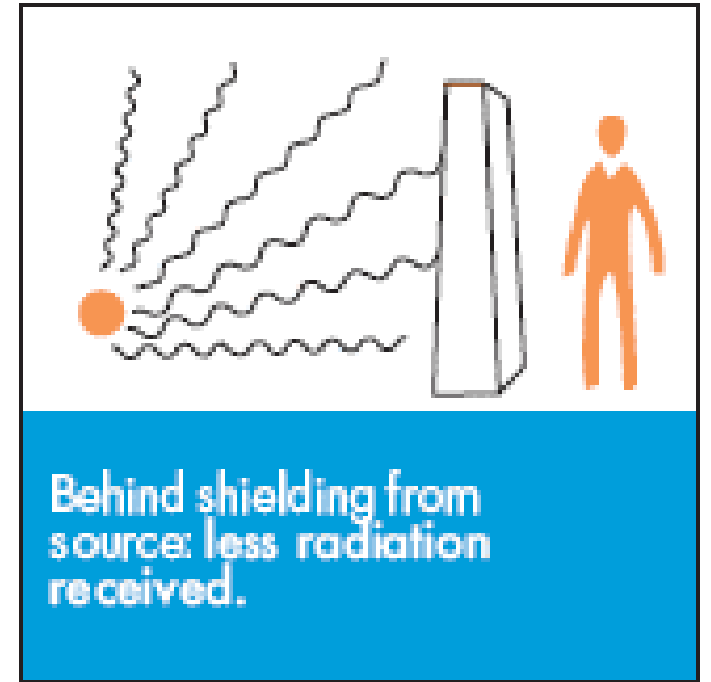
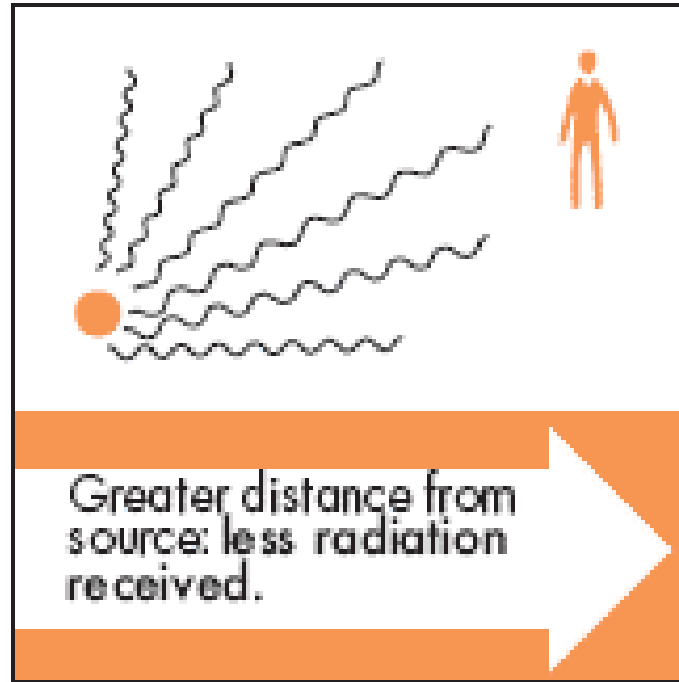
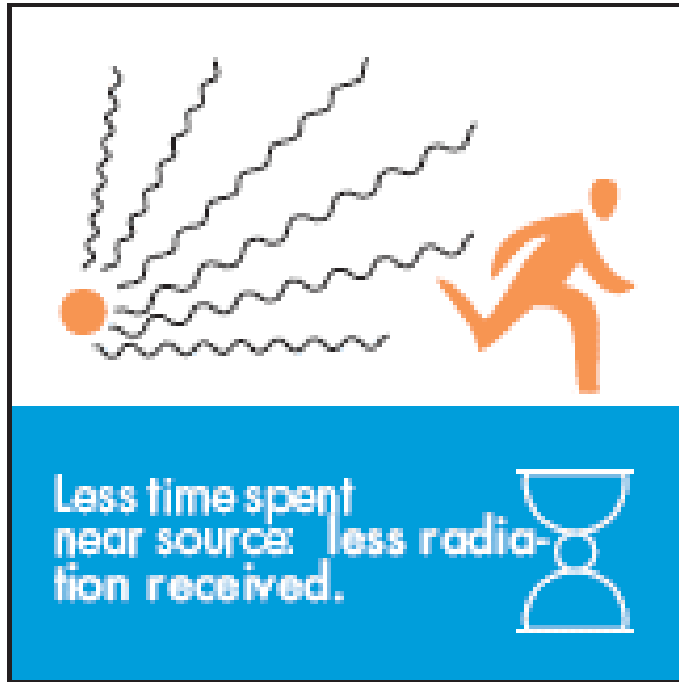


Radiation exposure – ats'ádziil bée'ádaáh

Ha'iisgeed bits'áádóó
t'áá ákqó nidaazhjaa'ígíi
éi doodago teetsoh t'áá
íidáá' hólónígíi
bits'ádziil éi ats'íis biih
shidoogizhgo hats'íistah
dooleetgo át'é

Health effects depend partly on the source of exposure – ihodiit'ée'hii éi bée'ásdzáhígíi bíhólníih





Binaa nijigháago bił hodilzhishígíi dóó t'áá bits'ąądi
nijigháhígíi dóó bine' na'adaii hólónígíi ęi bídahólníih

Ha'át'íish óolyé radon?

- Invisible radioactive gas – níłch'ih łikoní bits'ádziil hólónígíi (doo yit'ii da)
- Created when uranium in soil and rocks breaks down – éí łeeshtahdi dóó tséníi'di łeetsoh ałts'áháltqohgo bits'ąądóó hashoogish
- Measured with a radon kit – bee bí'neel'ąąhii hóló
- High levels increase risk of lung cancer – łąągo hólóqogo éí łóód doo nádziihii iididoołnahígíi dei át'jjh



How can a person be exposed to uranium – hait'áo bééjígghááh?



Bił da ajiyǿh éi
doodago ajidlǿh



Bił da ajidzih



Bízhdílnih dóó
nijich'idgo



Bits'ádziil
bééjígghááh

Community exposures (past) – t'áá kéédahojit'ííggóó bééjískai (nahdęé')



Díigi át'éego t'áá hooghangi béé'áldah:

- Łeetsoh yinaalnishí bił kéédahojit'ííggó
- Łeetsoh haagéedi kéédahojiťííggó
- Tó chodajooł'ínígíi łeetsoh bii' hólóqgo
- Bii' kééhojit'íinii łeetsoh bii'go éi doodago binítch'ih łikoní bił adajiidziihgo

Uranium worker exposures (past) – łeetsoh yindaalnishí yénáskai (nahdęé')

Díigi át'éego nidaalnishí ha'agééd dóó yik'áadi yénáskai:

- Ha'agééd dóó yik'áá góne' nidaalnishgo
- łeetsoh nideiiyéego
- Ha'agéedi kéedahat'įjgo

Díi óolyé naanishdi bée'áldah.



Diné łeetsoh hadeiigéđi. Photo by Milton Snow.
<http://www.inmotionmagazine.com/pym.html>

Community exposures (today) – t'áá kéédahojit'ǵǵígóó bééjíkah (díísh jǵǵdi)

Ha'agééd binaagi kéédahojit'ǵǵi éí doodago
t'áadoo le'é baa nijikaigo

Hahaasgeedii éí doodago hahaask'áanii bee kin
ádajile'go

Wóne'di binítch'ih ǵikoní hólóqgo



Tó yá'át'éehii choinít'j

- Nidląą dóó ch'iyáán bił
ánít'jigo dóó bee
nanibéego dóó táá'ígisgo
- Tó yá'át'éhígíi nihíyeeh
- Kééhwít'jigi tó
ádaat'éhígíi biniyé NTUA
bich'j' náhwílnih



Ch'iyáán baa áholyá

- Nanise' niyánígíí tánínánígis, bineest'ą' łeeyi' nihwiileehígíí tsík'eh
- Ats'ádziil hóótchxq'gi bits'ąądi k'ée'dídlééh
- Naaldlooshii ats'ádziil hóótchxq'gi bits'á yínílná

Reducing exposure to radiation – ats'ádziil bée'doodááłígíi yaa álnééh



Nighan bee ályaii hazho'ó nídííł'jįł



Nighan biníłch'ih łikoni nidíłłkah



Hada'iisgeedéę bits'ąą nanina



Hadahaasgeedii t'áadoo choiníł'ini



YOUR HEALTH

Uranium can have chemical and radiological effects on the body.

Chemical effects

Uranium is a chemical that is found naturally in the earth in small amounts. But high levels of uranium in the body can affect organs and body processes.

Radiation effects

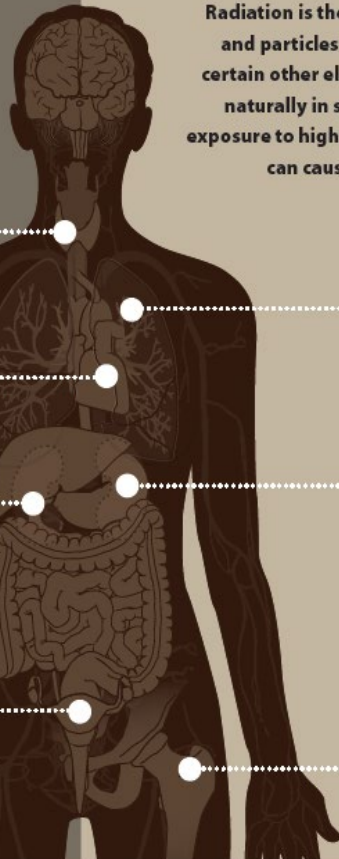
Radiation is the release of energy and particles from uranium and certain other elements. It is found naturally in small amounts. But exposure to high levels of radiation can cause health problems such as cancer.

Autoimmune function

High blood pressure

Kidney disease

Reproductive function



Lung Cancer

Kidney function

Bone cancer

More information and suggestions for staying healthy on the back page.

Nits'íístah Áhoot'éii

Health effects of uranium in food or water – tó ǽi doodago ch'iyáán bii'go

Łeetsoh ǽi béesh bideezla' át'é.

- Haa shǽi níłtsohgo bééjáyáhígǽi binahjǽ' ǽi hats'íis yihodidoołt'ih, hachá'áshk'azhǽi da
- Bééjǽgháhígǽi ní' át'jǽhgo ła' áádahoot'jǽh

Béé'ádáhígǽi dǽi ididoolnahígǽi dei ádayiit'jǽh.

- Hadił na'ałkidígǽi
- Hats'íis bii' naałniih yich'j' naabaahǽi bidadilna'ígǽi
- Binahjǽ' nida'iichíhígǽi bich'j' anáhwiit'éhígǽi

Uranium and Radiation
YOUR
Uranium can have chemical effects on your body.

Chemical effects

Uranium is a chemical that is found naturally in the earth in small amounts. But high levels of uranium in the body can affect organs and body processes.

- Autoimmune function
- High blood pressure
- Kidney disease
- Reproductive function

More information and suggestions for staying healthy are available at www.uraniumandradiation.ca

Health effects of radon and radiation – ats'íís yeiinít'j̣h

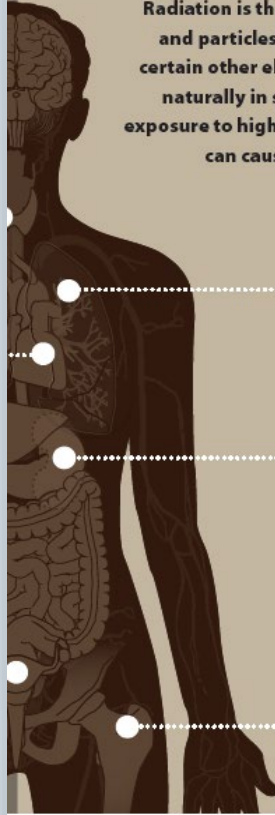
- Ajéí yilzólíi dóó ats'in łóód doo nádziihí bii' yileeh
- Achá'áshk'azhí naalnishígíi yaa át'j̣h

Ó'oolítígíi t'ahdoo ałtso bééhoozj̣h da, háálá t'ahdii naalkaah dóó baa óhoo'aah

Radiation on the Navajo Nation
R HEALTH
chemical and radiological effects on the body.

Radiation effects

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Lung Cancer

Kidney function

Bone cancer

for staying healthy on the back page.

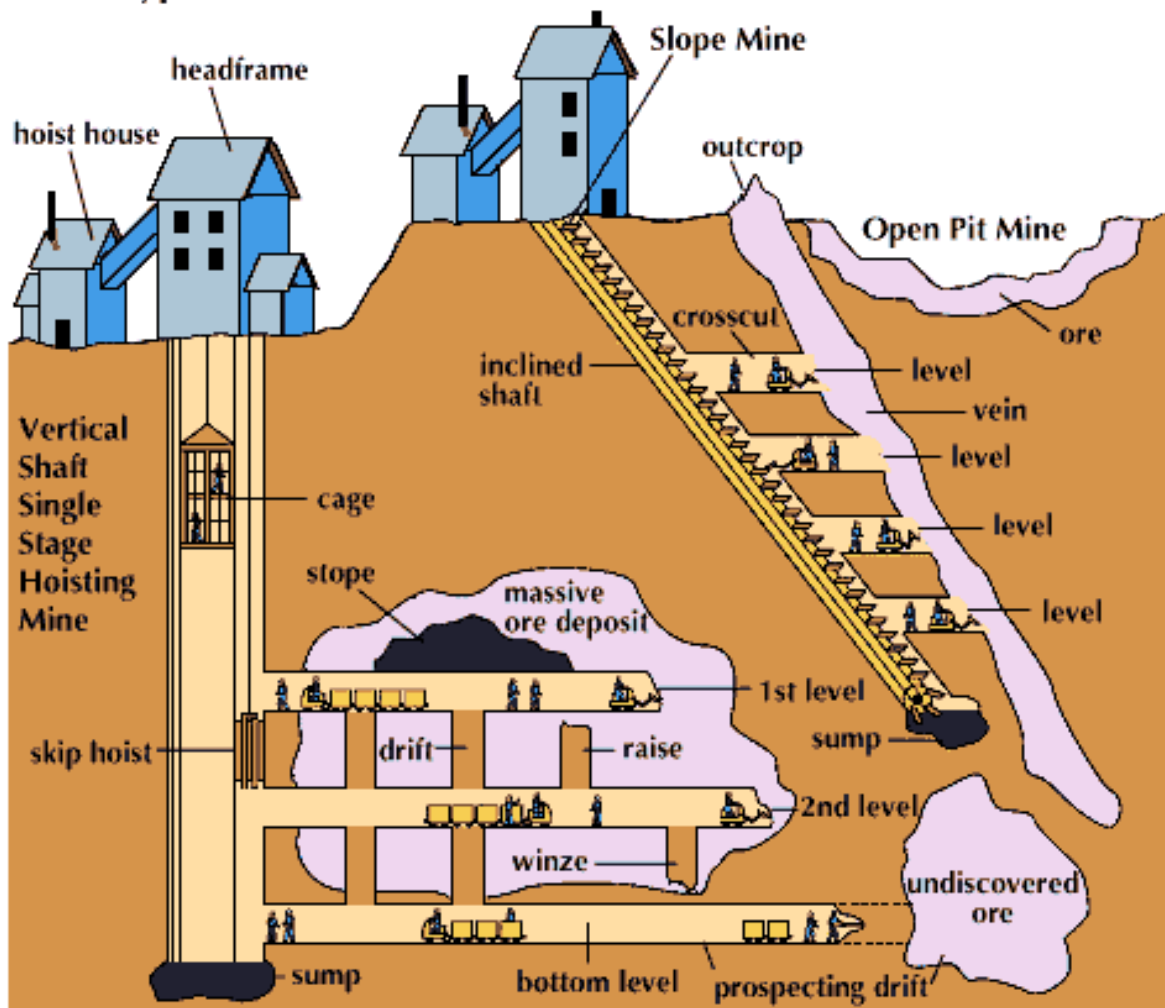
Healthy actions - bich'j' na'abaah



- T'áá ákwíi jį nits'íistah hósééh: “Just move it!”
- Áníníłdásígíi, áshįįh łikan aa náł'ínígíi, dóó nidił na'ałkidígíi hazhó'ó baa atínít'į
- Chxin bits'aą ádaa áhólyą, a'niniyįįhgo níla' tánínánígis
- T'áá ahxąąh azeé' ál'įįdi nánidi'nél'įįh
- T'áadoo ná'íłt'ohí
- K'é bee bił kééhót'íinii t'áá bił da'ahíínítą'
- Hózhą nanináá dóó nitsínikees

Uranium's history – nát'áá náháne'

Some Types of Mines



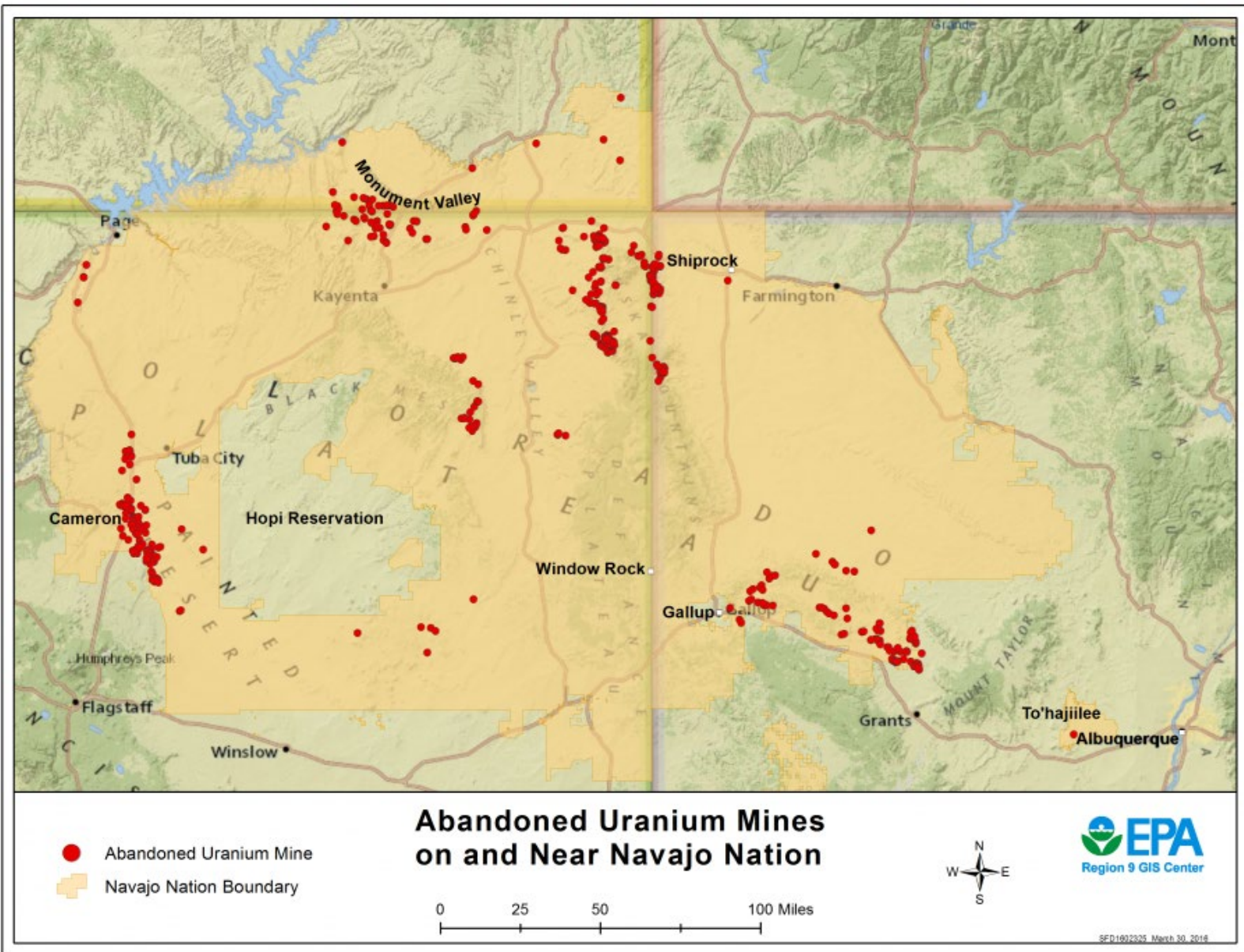
Uranium's history – nát'áá' náháne'



K'aabizhiidi Kerr-McGee bá łeetsoh bida'íniishgi Diné
łá' nidaalnish, T'áátsoh 7, 1953 yéędąá'. AP. Photo from
<http://www.npr.org/sections/health-shots/2016/04/10/473547227/for-the-navajo-nation-uranium-minings-deadly-legacy-lingers>



Tuba City, AZ uranium mill site.
Photo curtesy of US DOE, LMS Grand
Junction, CO office



Uranium's history – náat'áá' náháne'

Diné Bikéyah dóó binaagóó łeetsoh haagééd t'óó bik'eh dahoo'a'ígíi

Diné BiWááshindoon ʔeetsoh bi'ídiich'aat yideeshnishígíí

Navajo Abandoned Mine Lands Program

Ha'da'iisgeedéę dayííłta' dóó ba'át'e' bits'aą kéyah háadadidoolniígíí
yidadeeshnish

Navajo Environmental Protection Agency

Ni' bikáá'góó tó éi doodago diné bits'íís bídadooch'aatgo nawólnínígíí yik'eh ádahoolaa

Elected officials

Wááshindoondi Ayaai dóó Adei Hooghan yidááhdóó yaa nidahas'ne'

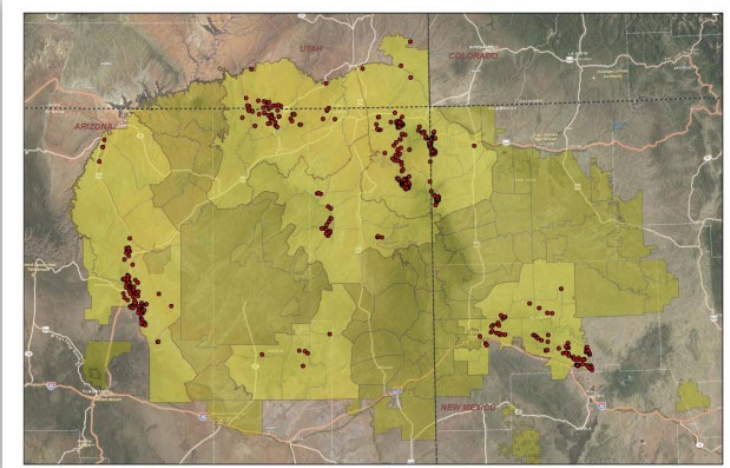


Wááshindoondéé' ʔeetsoh bi'ídiich'aaʔ yideeshnishígíí – “Ashdla' Nááhaigóó Yinaha'áii”


- Bi'ídiich'aaʔ nahjǫ́' ánídaalne' dóó háádahodilne'
- Tó nidadhiileehgóó nidaalkaah dóó tó yidlání yá'át'éehee diné bá ninályé
- Ha'iigéed t'óó bik'eh nahaz'ánígíí nidaalkaah
- Hadahwiisgeed dóó nida'iisgǫ́jǫ́gi atis ádaat'ehígíí háádahodilne'
- ʔeetsoh daak'áhéegóó ats'íís dóó binaa haz'ánígíí bich'ááh atíhát'ǫ́
- Ats'íís baa áháyáá dóó bína'niltin baa óhoo'aahígíí bá nídahoot'aah
- Community Outreach Network wólyéego bee ʔa'dilt'éego adoonish
 - *Uranium 101 – ʔeetsoh bína'niltin*

2014

Federal Actions to Address Impacts of Uranium Contamination in the Navajo Nation



The map displays the Navajo Nation territory in a light green color, with numerous red dots indicating uranium contamination sites. The map is bordered by the states of Utah, Colorado, Arizona, and New Mexico.



A row of logos for various federal agencies and organizations, including the Department of the Interior, United States Environmental Protection Agency, Department of Energy, Bureau of Indian Affairs, United States Nuclear Regulatory Commission, ATSDR, Indian Health Service, and a globe icon.

Díí éí Community Outreach Network hadeidiilaa dóó díí da'íniish bił nidahaz'áądóó ííjéé':

- Agency for Toxic Substances and Disease Registry
- Bureau of Indian Affairs
- Department of Energy
- Indian Health Service
- US Environmental Protection Agency
- Nuclear Regulatory Commission
- Navajo Nation Environmental Protection Agency
- Navajo Nation Department of Health – Community Health Representative Program
- Navajo Nation Department of Justice
- Navajo Nation Abandoned Mine Lands



Ahxéhee'!

- Na'alkaah dóó háadahodine'ígíí t'áá náás yiilt'ih
- Ats'íís yeiinít'ínígíí t'áá neiilkaah
- T'áá ahił hwiilne' dóó ahił neiilnish
- Nihahastóí dóó nihizáanii bits'áádóó ihwiil'aah; niha'áłchíní ninániitin

Łeetsoh Bi'ídiich'aał

- Hadahaasged dóó dáák'ánée
- Hadahodítéégóó dóó tsé dóó tó dóó łeeyi'di da łeetsoh dóó bits'ádziil baa hasti'ígi at'éego daneel'ánígíi

Yíiyá! Báháziid!

**Water from Platero Well (16T-521)*
in Baca-Prewitt-Haystack Chapter
is NOT safe to drink**

**Uranium, arsenic and gross alpha radioactivity
exceed drinking water standards*



Advisory issued May 2008 by

**Navajo Nation Environmental Protection Agency
U.S. Environmental Protection Agency Region-9
Navajo Nation Division of Health
Navajo Nation Veterinary & Livestock Program
Diné Network for Environmental Health (DINEH) Project
Call 928-871-7755 or visit www.navajopublicwater.org**



*Navajo Nation policy is that livestock-use-only wells are not to
be used for human drinking water.*