

R. G. Page, Chief, Enforcement Branch
Division of State & Licensee Relations, HQ

Original signed by
Roger T. Woolsey

December 4, 1964

Roger T. Woolsey, Radiation Specialist (Reviewer)
Region IV, Division of Compliance, Denver

VANADIUM CORPORATION OF AMERICA, SHIPROCK, NEW MEXICO
LICENSE NO. R-157, SUPPLEMENT TO INSPECTION REPORT

CO:IV:NPA

Transmitted for your information are the analytical results of samples taken during the inspection conducted August 12 and 13, 1964. Duplicate air samples were taken by the AEC and the licensee.

Air Samples
Uranium Natural

Location	AEC (uc/ml x 10 ⁻¹¹)	Licensee (uc/ml x 10 ⁻¹¹)
About 6 feet from yellow cake barrel during barreling	< 0.1	0.48
2nd floor above yellow cake barrel near filters	1.1	1.45
Ore drying and blending room	1.3	0.16
Grizzly - beside operator	0.3	0.32

Liquid Samples

San Juan River (downstream)	Ra-226	< 3 x 10 ⁻⁹ uc/ml
	Th-230	< 2 x 10 ⁻⁸ uc/ml
	U nat.	< 3 x 10 ⁻⁸ uc/ml
	Ra-223	< 7 x 10 ⁻⁹ uc/ml
	Pb-210	< 1 x 10 ⁻⁸ uc/ml
	Po-210	2.5 ± 0.3 x 10 ⁻⁸ uc/ml
San Juan River (upstream)	Ra-226	< 3 x 10 ⁻⁹ uc/ml
	Th-230	< 2 x 10 ⁻⁸ uc/ml
	U nat.	< 3 x 10 ⁻⁸ uc/ml
	Ra-223	< 7 x 10 ⁻⁹ uc/ml
	Pb-210	< 1 x 10 ⁻⁸ uc/ml
	Po-210	< 1 x 10 ⁻⁸ uc/ml

(continued)

<i>PLW</i> Woolsey 12-4-64				<i>A/188</i>
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8606120821 6pp.

Seepage 1A

Ra-226 $< 2 \times 10^{-8}$ uc/ml
Th-230 $< 2 \times 10^{-8}$ uc/ml

Seepage 3

Ra-226 1.2×10^{-8} uc/ml
Th-230 $< 2 \times 10^{-8}$ uc/ml

Seepage Drain (possibly rain hole)

Ra-226 $< 3 \times 10^{-9}$ uc/ml
Th-230 $< 2 \times 10^{-8}$ uc/ml

Called @ 5:00 12/4/74

Bill stated daughter growth too large
therefore absolute quantity Ra-226 is doubtful. He
stated that the value reported was the upper limit
and the absolute value probably less. He said
the lab background, at the time, was high which
could have affected the result.

PJA

ID T04
(R-1051)Division of Compliance, Region IV
P. O. Box 15206
Denver 15, Colorado 80215U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY BRANCHBaSO₄ rep'd
1100, 9/14

Serial No. 32006

ROUTINE X SPECIAL

IDO H & S SAMPLE RECORD SHEET

Sample from: SAN JUAN RIVER (VCA)

Samples Received: 8/21/64

Analyzed by: DP

Collected by: R. PAUL ALLEY

Analysis Completed:

Date submitted: 8/17/64

Method: End Window; Prop. counter ☒; Spectrophotometric; Fluorometric; Polarographic

Sample No.	Date	Hour	Sample Description	Anal. for	Quant. used, ml.	U-6 or K- Trans	Count time, min.	Total Count	Gross Count, c/m.	Bkgd., c/m.	Net count, c/m.	K ⁴⁰ corr., c/m.	Foreign activity
7			SAN JUAN (DOWNSTREAM)	Ra-226	500	1485 9/4	30	336		55	281		16/ml
			Cl-#3, recount			1445 9/11	30	248		11	237		< 3 x 10 ⁻⁹
			Cl-#4	Th-230	500	1400 9/15	30	250 276		49	201		< 2 x 10 ⁻⁸
			Ra recpt blank = 26 ± 6 net c/30m 1415, 9/4, Cl-#230	U-nat	D.O.I.				0.9	0.4	0.5		< 3 x 10 ⁻⁸
			Th Recpt Blank = 145 ± 13 net c/30' 1320 9/15	Ra-223									< 9 x 10 ⁻⁹
			Pb-210		500		30	1545 9/30 67		27			< 1 x 10 ⁻⁸
			Ra Recpt Bl recount = 23 ± 5 c/30' 1415 9/11	Po-210			30	60		26 (BLANK c ± 7n c/min)			(2.5 ± 0.3) x 10 ⁻⁸
			STD. is 42.0 S.D. for 0.05 µg of 26										

Notified: Time: Resampling Yes

recommended: No

Approved:

Chief, Analysis Section

U.S. Atomic Energy Commission
Division of Compliance, Region IV
P. O. Box 15266
Denver 15, Colorado 80215

U.S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY BRANCH

Bas 504 vppd
1100, 9/14 DP

Serial No.

33207

ROUTINE ☒ SPECIAL

IDO H & S SAMPLE RECORD SHEET

Sample from: **SAN JUAN RIVER**

(VCA)

Samples Received:

8/21/64

Analyzed by

DP + RA

Collected by: **N. PAUL ALLEY**

Analysis Completed:

Date submitted: **8/17/64**

Method: End Window ☒; Prop. counter ☒; Spectrophotometric ☐; Fluorometric ☐; Polarographic ☐

Sample No.	Date	Hour	Sample Description	Anal. for	Quant. used, ml.	U-6 or K ⁺ Trans.	Count time, min.	Total Count	Gross Count, c/m.	Bkgd., c/m.	Net count, c/m.	K ⁴⁰ corr., c/m.	Foreign activity
8	8/13		ctr #5 SAN JUAN (UPSTREAM)	Ra-226	500	1445 7/4	30	238		18	220		μc/ml < 3 × 10 ⁻⁹
			ctr #5 recount			1445 7/11	30	178		34	144		
			ctr #5	Th-230	500	1400 9/15	30	272 312		15	297		< 2 × 10 ⁻⁸
				U-238	0.01				0.9	0.4	0.5		< 3 × 10 ⁻⁸
				Ra-223	500								< 7 × 10 ⁻⁹
				Pb210	500		30	1615 9/30 74		27		Sepd. 1400, 9/29 0.86	< 1 × 10 ⁻⁸
				Po210	40		30	33		26 BLANK 0.37 n c/30 min			< 1 × 10 ⁻⁸

Ra 100% blank = 26 ± 6 net c/30 m
1415, 9/14 c/30 m

Th Recy Bl = 145 ± 13 c/30'
1320 9/15

Ra 100% blank recount
1415 9/11 23 ± 5 c/30'

STD is 43 P.S.D. for 0.05 μg of 21.

Notified: _____ Time: _____ Resampling Yes _____

recommended: No _____

Approved: _____

Chief Analysis Section

Chief, Analysis Branch

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY BRANCH
IDO H & S SAMPLE RECORD SHEET

BASO₄ rep'd
1215 9/1/64

Serial No. 33209

ROUTINE ☒ SPECIAL

Sample from: VCA Shiprock, N. M.

Samples Received: 8/21/64

Analyzed by: DP + RH.

Collected by: N. Paul Alley

Analysis Completed:

Date submitted: 8/17/64

Method: End Window; Prop. counter; Spectrophotometric; Fluorometric; Polarographic.

Sample No.	Date	Hour	Sample Description	Anat. for	Quant. used, ml.	U * 6 or K * Trans	Count time, min.	Total Count	Gross Count, c/m.	Bkgd., c/30'	Net count, c/m.	K ⁴⁰ corr., c/m.	Foreign activity
4	8/13		Seepage 1A	CTR 3	Ra-226 500	1550 9-1	30	101		1	1.2 x 10 ⁻⁸		1.2 x 10 ⁻⁸
			Ra range bl = 10 ± 3 net c/30'	Recount CTR 3		1500 9-8	30	693		12			
			9-1 @ 1515 CTR 3										
			Ra range bl = 20 net c/30'	CTR 5	Th-230 200	1320 9-15	30	128		15			1.2 x 10 ⁻⁸
			9-8 @ 1500 CTR 4										
5	8/13		Seepage 3	CTR 230	Ra-226 500	1550 9-1	30	285		5			1.2 x 10 ⁻⁸
				CTR 230		1500 9-8	30	560		4			
			Th ²³⁰ range bl = 14 ± 13 net c/30'										
			1330 9-3 CTR 230										
				CTR 230	Th-230 500	1330 9-3	30	188		5			1.2 x 10 ⁻⁸
6	8/13		Drain (Possible Rain Hole)	CTR 2	Ra-226 500	1415 9-4	30	102		52			1.3 x 10 ⁻⁹
			Ra range bl = 26 ± 6 net c/30'										
			1415 9-4 CTR 230										
					Th-230 500	1400 9-15	30	174		5			1.2 x 10 ⁻⁸

Notified: Time: Resampling Yes

recommended: No

Approved:

Chief Analysis Section

40-2038 + 6642
-68
Fed. Div. of Compliance

VANADIUM CORPORATION OF AMERICA

PAGE EDWARDS SENIOR MANAGER
AEC NEW MEX

SHIPROCK, NEW MEXICO

December 15, 1964

Mr. Donald A. Nussbaumer
Source and Special Nuclear Material Branch
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Nussbaumer:

Subsequent to December 15, 1964, Mr. Wayne F. Lowry will assume those responsibilities for the radiation control programs at our Shiprock and Monument facilities which were previously assigned to Mr. Frank Hanagarne. The qualifications of Mr. Lowry are as follows:

Employment History

1948 - 1953	Instructor of Chemistry and Physics at Fort Lewis College, Colorado.
1953 - 1962	Metallurgical chemist and chief chemist at Vanadium Corporation of America, Durango, Colorado.
1962 to present	Chief chemist at Vanadium Corporation of America, Shiprock, New Mexico.

Academic History

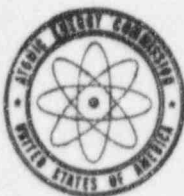
B. A. with major in chemistry from Milton College, Wisconsin. Approximately 38 hours of graduate work in chemistry and physics at the University of Colorado.

Very truly yours,

PE:lm
encls: 3 copies

8606120510 10.

A/189



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:

DML:DFH

40-6643, SUA-547, Amendment No. 1

40-2038, SUA-789, Amendment No. 2

DEC 24 1964

Category II A ; Priority TE
jm *n*

Vanadium Corporation of America
Shiprock, New Mexico

Attention: Mr. Page Edwards, General Manager
Western Mines

Gentlemen:

In accordance with the information contained in your letter of December 15, 1964, Item 8 of AEC Source Material Licenses Nos. SUA-547 and SUA-789 is hereby amended to include the date December 15, 1964.

We appreciate being informed of such administrative changes in your organization.

FOR THE ATOMIC ENERGY COMMISSION

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Br.
Division of Materials Licensing

DISTRIBUTION:

Doc. Room (2)

Compliance (2)

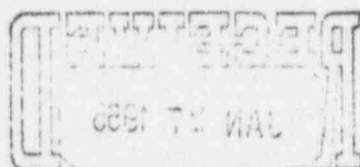
Suppl. (2)

State Health

N. Doulos, ML (3)

E. Van Blarcom (2)

Er. & Div. RFS



DIVISION OF COMPLIANCE
REGION IV

A1190

8606/20853 1p

Vanadium Corporation of America

PAGE EDWARDS, General Manager
WESTERN MINES

SHIPROCK, NEW MEXICO

July 29, 1965



Mr. Donald A. Nussbaumer
Source and Special Nuclear Material Branch
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

Re: A.E.C. Source Material License - SUA 789

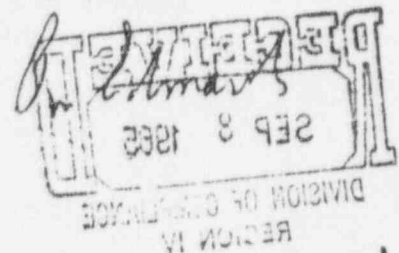
Dear Mr. Nussbaumer:

We request permission to discontinue the water sampling of Seep #1 as identified in our license renewal application of June 18, 1963.

In justification of this request, the assay data from Seep #1 during 1964 showed the following:

Period	Uranium $\mu\text{c/ml} \times 10^{-5}$	Ra 226 $\mu\text{c/ml} \times 10^{-8}$	Th 230 $\mu\text{c/ml} \times 10^{-6}$
1st Quarter, 1964	0.19	0.04	0.0007
2nd Quarter, 1964	0.03	0.17	0.0003
3rd Quarter, 1964	0.05	0.04	0.0003
4th Quarter, 1964	0.006	0.009	Background
Average for 1964	0.069	0.065	<0.0004
Fraction of 10 CFR 20 limit	0.035	0.065	<0.0008

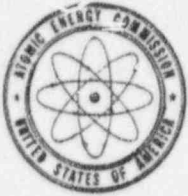
Very truly yours,



PE:lm
encls. (3 copies)
cc: Robert F. Bell, M.D.

A/191
2594

8606120498 11.



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:

DA-1074
10-1038
AUA-789, Amendment No. 3

AUG 9 1965

Category I : Priority II

Vanadium Corporation of America
Chiricah, New Mexico

Attention: Mr. Page Edwards, General Manager
Western Mines

Gentlemen:

In accordance with the information contained in your application dated July 29, 1965, Item 8 of AEC Source Material License No. AUA-789 is hereby amended to include the date of July 29, 1965. This amendment authorizes the discontinuance of sampling "Seep #1" as identified in your application of June 18, 1963.

FOR THE ATOMIC ENERGY COMMISSION

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch
Division of Materials Licensing

DISTRIBUTION:
Suppl.
Doc. Room
Compliance, Region IV
State Health
N. Doulos, ML (3)
Br. & Div. RPs



A/192

860420863 1 p.

Vanadium Corporation of America

For Div of Compliance (IV)

PAGE EDWARDS, General Manager
WESTERN MINES

SHIPROCK, NEW MEXICO

September 7, 1965

Mr. Donald A. Nussbaumer
Source and Special Nuclear Material Branch
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: Liquid Effluent Assay
Source Material License No. SUA-789

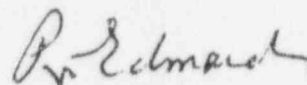
Dear Mr. Nussbaumer:

We request that the assay for Th 230 concentration be deleted from the license requirements of the liquid effluent sampling program at our Shiprock mill operations.

In justification of this request, the accompanying table shows the Thorium 230 concentrations obtained from the 2nd quarter 1963 through the 2nd quarter 1965.

We will continue to assay these water samples for natural uranium and Ra 226.

Very truly yours,



PE:lm
encls. (3 copies)
4 copies Th 230 table

cc: Robert F. Bell, M.D. w/encl.

A/193

302

8606120476 2 pp.

VANADIUM CORPORATION OF AMERICA
SHIPROCK, NEW MEXICO

September 7, 1965

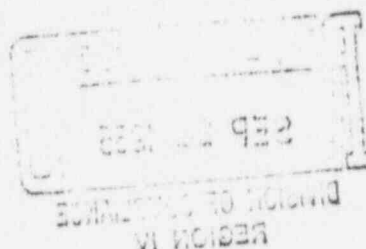
VANADIUM CORPORATION OF AMERICA
Liquid Effluent Samples

Period	Th230 (uc/ml x 10 ⁻⁶)			
	River Upstream	River Downstream A	River Downstream B	Seep Composite
2nd Quarter 1965	0.006	nil	0.0009	0.002
1st Quarter 1965	nil	nil	nil	0.0009
4th Quarter 1964	nil	0.001	0.0006	0.005
3rd Quarter 1964	0.0009	0.0006	0.001	0.001
2nd Quarter 1964	0.002	0.001	0.0005	0.0003
1st Quarter 1964	0.001	0.001	0.001	0.002
4th Quarter 1963	<0.0002	0.0003	<0.0002	0.002
3rd Quarter 1963	nil	nil	nil	0.003
2nd Quarter 1963	0.0003	nil	0.00009	0.001

Nil - equivalent to background

Th230 determinations by Radiation Detection Company

PE:lm



Vanadium Corporation of America

Ext Div of Compliance

PAGE EDWARDS, General Manager
WESTERN MINES

SHIPROCK, NEW MEXICO

September 7, 1965

Mr. Donald A. Nussbaumer
Source and Special Nuclear Material Branch
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

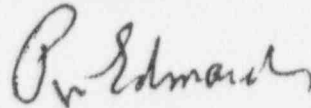
Subject: Proposed Amendments to Source Material
License SUA-789

Dear Mr. Nussbaumer:

We request that our film badge program be limited to only those employees who are assigned to duties in the uranium precipitation, filtering, drying and packaging sections. Our records indicate that the expected external radiation dose to other employees is less than 25% of the 10CFR20 limit. Badges from the above identified final product employees will be processed quarterly.

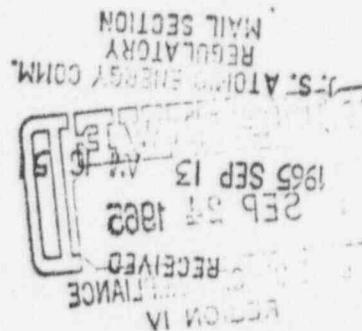
We also request the deletion of beta-gamma readings from our unrestricted area survey program requirements. This external radiation information does not have any apparent usefulness to our program.

Very truly yours,



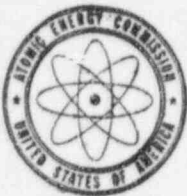
PE:lm
encls. (3 copies)

cc: Robert F. Bell, M.D.



A/194

8606120487/1.



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:

DAL:DPH

40-2038

SUA-789, Amendment No. 3

SEP 22 1965

Category I Priority II
2413 *UR*

Vanadium Corporation of America
Shiprock, New Mexico

Attention: Mr. Page Edwards, General Manager
Western Mines

Gentlemen:

In accordance with your request of September 7, 1965, regarding your film badge and unrestricted area survey programs, Item 3 of AEC Source Material License No. SUA-789 is hereby amended to include the date of September 7, 1965; except that, this amendment shall not be considered as an exception from Section 20.202 of 10 CFR 20.

The foregoing amendment no longer requires you to conduct your film badge program in accordance with the procedures described in Item 12(c) of your application dated June 18, 1963. However, the amendment does require you to provide personnel monitoring devices to employees in accordance with the provisions of Section 20.202 of 10 CFR 20 and the procedures described in your application of September 7. The foregoing amendment also deletes the requirement of conducting external radiation surveys in unrestricted areas as provided in Item 12(c) of your application dated June 18, 1963.

Please contact us if you should have any question concerning the foregoing.

FOR THE ATOMIC ENERGY COMMISSION

DISTRIBUTION:

Doc. No.

Mr. & Div. rfs

Compliance IV

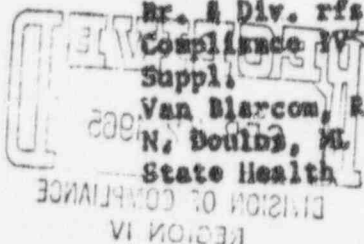
Suppl.

Van Blarcom, RM (2)

N. Doulos, ML (3)

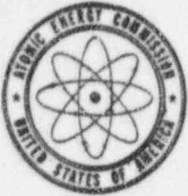
State Health

Donald A. Massbauer, Chief
Source and Special Nuclear Materials Branch
Division of Materials Licensing



A/195

8606120885 /p.



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

IN REPLY REFER TO:

DML:DFU
40-2038
SUA-789, Amendment No. 4

SEP 22 1965

Category I Priority II
218

SVA
Am.
9/21

Vanadium Corporation of America
Shiprock, New Mexico

Attention: Mr. Page Edwards, General Manager
Western Mines

Gentlemen:

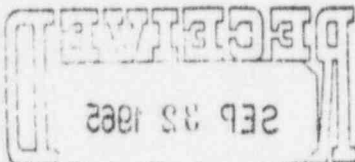
In accordance with the information contained in your application dated September 7, 1965, Item 8 of AEC Source Material License No. SUA-789 is hereby amended to include the date of September 7, 1965. This amendment authorizes the discontinuance of assaying for Th-230 in your liquid effluent survey program.

FOR THE ATOMIC ENERGY COMMISSION

DISTRIBUTION:

Doc. Rm.
Br. & Div. rfs
Compliance IV
Suppo. (2)
Van Blarcom, RM (3)
N. Douglas, ML (3)
State Health

Donald A. Nussbaumer, Chief
Source and Special Nuclear Materials
Branch
Division of Materials Licensing



DIVISION OF COMPLIANCE
REGION IV

8606120897 18