**Technical Report** 

on the

# Sunday Mine Complex Uranium Property,

# San Miguel County, Colorado, USA

for

Western Uranium Corporation Inc.



By

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Cover photo: View of the Sunday/Carnation mine buildings and dumps from the Gypsum Valley floor.

### **Item 1: Summary**

Western Uranium Corporation (WUC) engaged Anthony R. Adkins, of Anthony R. Adkins, P. Geol., LLC to review the Sunday Mine Complex Project data, provide a Canadian National Instrument 43-101 complaint Technical Report describing the current status of the project, including a resource estimate. Mr. Adkins visited the property in the late 1970's and again on July 6, 2015. WUC is the owner and manager of the Sunday Mine Complex Uranium Project through its wholly owned subsidiary, Pinion Ridge Mining LLC (PRML).

The Sunday Mine Complex is an advanced stage property with a significant drilling and production history. Mining and drilling occurred contemporaneously from the 1950's through the mid 1980's. From the 1980's to the present, mining and drilling occurred only sporadically, typically when uranium or vanadium prices were high. The last mining interval was from 2006 to 2009, and based on the available records, only in 2009 did any drilling take place since mid-1980. Past operators have generated abundant geologic and mining data. However, to date, only a small amount has been passed along to WUC and the author of this report.

Geologically, the main hosts for uranium-vanadium mineralization in the Sunday Mine Complex are fluvial sandstone beds assigned to the upper part of the Salt Wash Member of the Jurassic Morrison Formation, with minor production coming from conglomeratic sandstones assigned to the lower portion of the Brushy Basin Member of the Morrison Formation. Mineralization from both members is present at the property, with the mine production coming from the Salt Wash Member. Beds generally strike NW-SE and dip SW, with some exceptions within fault bounded blocks adjacent to Big Gypsum Valley.

The Uravan Mineral Belt has a long history of exploration and mining for uranium and vanadium. The deposits have been well studied by public and private entities. Reserve and resource estimation methods have been a topic of interest for most of that long history. Both traditional methods and computer modeling have been used and each have their advantages and limitations. For the purpose of this report, and at the confidence levels that the data will allow, traditional methods such are areas of influence around drill holes and around mineralized areas were considered appropriate.

Sunday Mine Com	ort							
Measured			Indicated			Inferred		
Tons (st)	Lbs U3O8	Lbs V2O5	Tons (st)	Lbs U3O8	Lbs V2O5	Tons (st)	Lbs U3O8	Lbs V2O5
188,243	935,150	5,610,899	14,974	72,683	436,097	264,604	1,906,081	11,436,484
Grade (%)	0.25	1.49		0.24	1.49		0.36	2.16
Measured and				Grade	Grade			
Indicated	Tons (st)	Lbs U3O8	Lbs V2O5	U3O8 (%)	V2O5 (%)			
	203,170	1,007,830	6,047,000	0.25	1.49			

The resource estimate in this report is summarized in Table 1.1

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Table 1.1: Sunday Mine Complex undiluted geologic resource estimate summary

The Sunday Mine Complex, based on historical records and this 43-101 compliant resource estimate, appears to have very good to excellent potential to host in excess of 3,000,000 pounds of uranium-vanadium resources with characteristics suitable for underground mining. As per Items 15 through 22, an economic assessment of the resource base has yet to be conducted.

Two parallel paths of: 1) additional data acquisition and 3-D computer modeling along with, 2) a concurrent 10 hole drill program to verify and confirm trends is recommended. The first path is estimated to cost between \$(us)50,000 and \$(us)100,000 and the second at around \$(us)185,500, for a total estimated cost from about \$(us) 235,500 to \$(us)285,500.

### **Item 2: Introduction**

Anthony R. Adkins, P. Geol., LLC has been requested by Western Uranium Corporation to prepare an Independent Technical Report compliant with the Canadian National Instrument 43-101 on the Sunday Mine Complex Uranium (SMC) Project, an advanced-stage uranium property. This report has been prepared to meet the standards of NI 43-101 and Form 43-101F1. WUC is the owner and manager of the Sunday Mine Complex Uranium Project through its wholly owned subsidiary, Pinion Ridge Mining LLC (PRML).

The author, Anthony R. Adkins, has visited the property in the late 1970's, and again on July 6, 2015. The property has seen significant historic uranium and vanadium exploration and mining, most recently by Denison Mines Corporation from 2006 to 2009. The available private-sector records, all supplied by WUC, indicates historic drilling and mining activity from about 1955 to about 2009.

Given the nature of the historic database, all measurements are in English units, although the metric equivalents are listed where appropriate. Uranium grades are expressed as percent (%)  $U_3O_8$  when based on chemical assays and %eU<sub>3</sub>O<sub>8</sub> (e = equivalent) when based on radiometric data. Currency amounts are in US dollars.

μ	micro (one-millionth)
°C	degree Celsius
°F	degree Fahrenheit
μg	microgram
А	ampere
а	annum
m <sup>3</sup> /h	cubic metres per hour
CFM	cubic metres per minute
bbl	barrels
Btu	British thermal units
C\$	Canadian dollars
cal	calorie
cm	centimetre
cm <sup>2</sup>	square centimetre
ct	carat (0.2 grams)
d	day
dia.	diameter
dmt	dry metric tonne
dwt	dead-weight ton

#### 2.1 List of Abbreviations

square kilometre
megavolt-amperes
kilopascal
kilovolt-amperes
kilowatt
kilowatt-hour
litre
litres per second
metre
mega (million)
square metre
cubic metre
millidarcy
minute
metres above sea level
millimetre
mile per hour
megawatt
megawatt-hour

ft	foot
ft/s	foot per second
ft <sup>2</sup>	square foot
ft <sup>3</sup>	cubic foot
g	gram
G	giga (billion)
gal	imperial gallon
g/l	gram per litre
g/t	gram per tonne
gpm	imperial gallons per minute
gr/ft <sup>3</sup>	grain per cubic foot
gr/m <sup>3</sup>	grain per cubic metre
hr	hour
ha	hectare
hp	horsepower
in	inch
in <sup>2</sup>	square inch
j	joule
k	kilo (thousand)
kcal	kilocalorie
kg	kilogram
km	kilometre
km/h	kilometre per hour

m³/h	cubic metres per hour
opt, oz/st	ounce per short ton
OZ	troy ounce (31.1035g)
oz/dmt	ounce per dry metric tonne
ppm, ppb	part per million; billion
psia	pound per square inch absolute
psig	pound per square inch gauge
s	second
st	short ton
stpa	short ton per year
stpd	short ton per day
t	metric tonne
tpa	metric tonne per year
tpd	metric tonne per day
US\$	United States dollar
USg	United States gallon
USgpm	US gallon per minute
v	volt
W	watt
wmt	wet metric tonne
yd <sup>3</sup>	cubic yard
yr	year

Table 2.1 List of abbreviations

#### **Item 3: Reliance on Other Experts**

This report is the sole work of Anthony R. Adkins, a Qualified Person (QP) as per the NI 43-101 criteria. The resource estimate given in Item 14 is a combination of work done by Energy Fuels Resources (EFR) personnel and by the author of this report. The EFR work has been verified by the author of this report.

The information, opinions, estimates and conclusions contained in the report are based on:

- 1) Information available to the author at the time of the report
- 2) Assumptions, conditions, and qualifications as set forth in this report, and
- 3) Data, reports, and opinions supplied by WUC and other third party sources listed as references.

The author has relied on WUC for information regarding the current status of legal title, property agreements, and any outstanding environmental conditions, agreements or orders. The author has not independently investigated, in detail, the legal status of the claims or the permitting and reclamation status of the property.

#### **Item 4: Property Description and Location**

The Sunday Mine Complex is an exploration stage uranium property located in San Miguel County, Colorado, USA. The distance from Denver, the State Capitol, is about 235 mi (390 km) southwest. Centroid coordinates of the project are 692,400E; 4,215,900N, (NAD83, UTM Zone 12). Legal land description is Secs. 10, 11, 13, 14, 15, 22, 23, 24, and 26, T.44N., R.18W., and

Secs. 18, 19, 20, and 30, T.44N., R. 17W., New Mexico Prime Meridian.

The Sunday Mine Complex consists of approximately 233 contiguous unpatented mining claims that total about 3,748 acres (1,517 ha). Each claim, which can have a size of up to a maximum of 1500 feet long by 600 feet wide (457m by 183m). A maximum-sized claim covers an area of 20.66 acres (8.36 ha). The SMC claims are located on land where both the surface and mineral ownership is held by the Bureau of Land Management (BLM), part of the US Department of Interior. Figure 4.1 shows the property location in southwestern Colorado relative to the Uravan Mineral Belt (UMB), Figure 4.2 is a map of the property and Figure 4.3 is panoramic view of the SMC along the South Gypsum Ridge.

Valid unpatented mining claims grant the holder the right of mineral possession as allowed by the General Mining Law of 1872, subject to the various State and Federal rules and regulation pertaining to mineral exploitation,. Only certain minerals can be located under the Mining Law, and uranium and vanadium are two of those minerals. Claim locations and status were provided by WUC and were taken at face value. No title work was done on the claims or claim documents. A check with the BLM's LR2000 claim database indicates that the annual claim maintenance fees have been paid until 1 September 2015.

# Item 5: Accessibility, Climate, Local Resources, Infrastructure and Physiography

The property is best accessed from Colorado. Access from Colorado is via State Highway 141 east out of Naturita, CO for about 3.7 mi (6 km) until the 141/145 Highway junction, then about 22.4 mi (36 km) south on Hwy 141, then about 6.2 mi (10 km) northwest on County Road 20R (Gypsum Valley Road). The State Highway 141 is a paved all-weather road and the County Road 20R is a gravel road passable in all but the worst weather.

Population centers with some services near the project are the Nucla/Naturita, and Dove Creek areas of Colorado. The nearest city to support exploration and mining activities is Grand Junction, CO., or possibly Cortez, CO.

The Climate is strongly influenced by topography, which varies in the larger claim area from approximately 5,700 ft (1,737 m) to 6,300 ft (1,921 m) AMSL. Topographically, the area consists of low ridge between two valleys that largely correlate to geology (see section 7, below). Summer lows and highs range from the 40's and 50's to the high 90's°F (4 to 10, 36°C) with a few days in the 100's°F (38°C). Winter low and highs vary from 0°F to -10°F up to the 60's (-23 to -18, 16°C) on some sunny days. Average yearly precipitation is between 10 and 12 inches (25 to 30 cm). Snowfall can occur, but not consistently, and can reach depths of 12 inches (30 cm) during period of prolonged storms. Most snow melts between storms. Good road access for cars and light trucks is year-round, although continuous heavy equipment travel would most likely require some level of Governmental permitting.

As the SMC has seen a number of years of production, it has a well-developed mining infrastructure with a good network of roads and power lines.



Figure 4.1. General location map and access map of the Sunday Mine Complex and the Uravan Mineral Belt. Image from Google Maps, UMB outline from Chenoweth, (1981)



Figure 4.2. Property boundary map of the Sunday Mine Complex over topography. Base image from USA Topo Maps.

## **Item 6: History**

#### 6.1 Prior Ownership

The Sunday Mine Complex consists of six different mines. These are the Topaz, West Sunday, Sunday, St. Jude, Carnation, and the GMG. The mines have had a number of owners and operators. Maps and documents made available to the author show that the following companies have been involved in the all or parts of the property prior to WUC acquisition of the SMC in April 2014: Matterhorn Mining (1950's-1960's, Climax Uranium 1960's, Union Carbide Corporation (UCC) 1970's-1980's, Atlas Minerals (1980's), Energy Fuels Nuclear (early 1990's), International Uranium Corp. (1990's-2000's), Denison Mines (USA) (2000's), and Energy Fuels (2010's). The documents are incomplete as so this list may be as well. Since UCC days, the ownership has been clear. In 1983 Union Carbide transferred its mineral interests to UMETCO, a wholly-owned subsidiary. For the sake of consistency, the name Union Carbide will be used even if technically the ownership was UMETCO at the time.



Figure 4.3. Panoramic view of the Gypsum Valley side of the SMC looking southwest from across Gypsum Valley. Mine dumps from left to right are the Sunday/Carnation, St. Jude and West Sunday. The Topaz mine is out of sight on the far right, tucked into a drainage.

#### **6.2 Previous Work**

Records made available to the author by WUC and a search of public documents on-line indicates exploration drilling starting on the property in the early 1950's. Two Defense Minerals Exploration Administration (DMEA) reports, one on the Sunday area and the other on the Topaz area, indicated some drilling and minor surface extraction had occurred by the mid 1950's (DMEA, 1953 & 1956). Additionally, historic maps of the area show the Sunday mines in operation in the 1950's (Denison Mines, 2008).

The records & antedotal evidence indicate that from the mid-1960's until the early 1980's, the SMC produced material from relatively steady ongoing mining operations. These ceased in 1984 when Union Carbide closed their Uravan mill. Since then, the property has been idle, with the exception of brief periods in the late 1980's when UCC mined for a short time during a spike in vanadium prices, in the mid-1990's with International Uranium Corporation and and another one in 2006-2009 when Denison Mines extracted ore from the mine. During all three periods, the ore was processed at the White Mesa Mill located just south of Blanding, UT.

Exploration and development drilling on the property was contemporaneous with the mining. The available database records show that at least 1,419 holes have been drilled on the property. This is an incomplete list, as an examination of the available maps and cross-sections show a number of holes that are not in the database. A best estimate for total distance drilled is about 850,100 ft (259,175 m). Antedotal evidence and some maps also give evidence that underground long holes (test holes drilled from the mine workings anywhere from 50 ft (15 m) to 300 ft (91 m) long) were used extensively throughout the mined areas.

The 2-D digitized mine workings, done by Denison Mines show extensive stoping and drifting within parts of the SMC. Generational mime maps indicate that more mine workings exist than are shown in the digital database. A very conservative rough estimate of the linear mine workings based on the digital database is in excess of 50,000 ft (15,244 m) with many stopes. Figure 6.2.1 shows the known drill hole and mine working locations.

Based on the records and on field inspection, it is evident that the Property has a significant history of drill exploration and mine development.

#### **6.3 Historical Resource Estimates**

A search of the SEDAR database shows that there have been no Canadian National Instrument 43-101 compliant Technical Reports filed on the SMC

Recently discovered UCC internal documents (Hollingsworth, 1989) list detailed reserves for the SMC as of the end of 1988. These have been extracted from the document by the author of this report and are listed in Table 6.3.1 with minor annotations. Figure 6.3.1 shows the approximate location of the Claims or Depletion Units



Figure 6.2.1. Property drill hole and mine workings map from database records. Grid is Colorado State Plane, Zone 503. North is to the top.

Sunday Mine Complex Ore Reserve Estimate by UCC Staff - E.O.Y 1988 using mining methods emphasising tons							Revised by JSH for mining emphasising pounds							
Claim or Depletion		Tons	Tons	Tons	Total Tons	% Grade	% Grade	Pounds	Pounds	Total	%	%	Pounds	Pounds
Unit		Measured	Indicated	Inferred		V2O5	U3O8	V2O5	U3O8	Tons	Grade	Grade	V2O5	U3O8
Awald #1	718	7,600	6,300	5,100	1,900	1.38	0.19	524,400	72,200	14,100	1.70	0.23	479,400	64,860
Awald #2	719	3,400	4,100	2,500	10,000	1.38	0.19	276,000	38,000	9,000	1.63	0.22	293,400	39,600
Awald #3	720	3,100	1,300	300	5,000	1.15	0.17	115,000	17,000	4,500	1.37	0.19	123,300	17,100
Awald #4	721	6,500	7,800	5,700	20,000	1.15	0.17	460,000	68,000	15,100	1.36	0.18	410,720	54,360
Elda Jo #2	722	8,300	8,900	5,700	22,900	1.31	0.18	599,980	82,440	18,700	1.53	0.22	572,220	82,260
North Sunday	723	6,500	8,000	5,500	20,000	1.10	0.17	440,000	68,000	12,000	1.60	0.22	384,000	52,800
South Sunday	724	7,800	9,700	6,800	24,300	1.09	0.17	539,740	82,620	18,800	1.48	0.22	556,480	82,720
GMG #2	727	5,700	6,900	4,700	17,300	1.10	0.17	380,600	58,820	17,000	1.96	0.23	666,400	78,200
GMG #3	728	5,000	6,100	4,200	15,300	1.1	0.17	336,700	52,020	15,000	1.96	0.23	588,000	69,000
GMG #4	729	0	200	300	500	1.1	0.17	11,000	1,700	0	0	0	0	0
GMG, GMG #0	730	1,600	1,800	1,600	5,000	1.28	0.18	128,000	18,000	4,500	1.51	0.20	135,900	18,000
GMG #11. #12	731	4,500	5,500	3,700	13,700	1.10	0 17	301,400	46,580	13,700	1.25	0.22	342,500	60,280
Awald #5	733	3,800	3,800	3,400	11,000	1.10	0.17	242,000	37,400	8,300	1	0 18	207,500	29,880
EIda Jo #1	734	10,100	12,000	7,900	30,000	1.22	0.18	732,000	108,000	27,000	1.43	0.20	772,200	108,000
EIda Jo #3	735	7,600	25,200	6,900	40,000	1.24	0.17	992,000	136,000	30,000	1.24	0.18	744,000	108,000
GMG #1	736	4,500	8,600	5,800	18,900	1.1	0.17	415,800	64,260	7,000	1.35	0.14	189,000	20
Bebee #6	737	12,400	13,900	3,700	30,000	1.70	0.26	1,020,000	156,000	30,000	2.25	0.35	1,350,000	210,000
Bebee #7	738	29,600	35,000	8,900	73,500	1.70	0.26	2,499,000	382,200	63,700	1.97	0.30	2,509,780	382,200
Bebee #8	739	4,100	1,000	700	5,800	1.70	0.26	197,200	30,160	5,800	1.76	0.27	204,160	31,320
Hocker #3	740	6,300	7,500	1,700	15,560	1.70	0.26	527,000	60,600	13,400	1.97	0.30	527,960	80,400
Bebee #3	741	1,700	2,000	500	4,200	1.70	0.26	142,800	21,840	4,200	1.70	0.26	142,800	21,840
Bebee #4	742	13,100	15,500	3,500	32,100	1.70	0.26	1,091,400	166,920	32,100	1.83	0.28	1,174,860	179,760
Bebee #5	743	15,200	16,800	4,500	36,500	1.70	0.26	1,241,000	189,800	31,600	1.97	0.3	1,245,040	189,600
Hocker #4	744	3,200	3,700	800	7,700	1.70	0.26	261,800	40,040	7,700	1.83	0.28	281,820	43,120
Hocker #10	745	5,400	18,000	0	23,400	1.26	0.22	589,680	102,960	21,500	1.37	0.24	589,100	103,200
Bebee #10	746	1,300	1,800	900	4,000	1.26	0.22	100,800	17,600	4,000	1.37	0.24	109,600	19,200
Bebee #9	747	1,750	5,000	1,250	8,000	1.7	0.26	272,000	41,600	8,000	1.44	0.22	230,400	35,200
St. Jude	756	54,500	16,900	22,600	94,000	1.20	0.19	2,256,000	357,200	94,000	1.2	0.19	2,256,000	357,200
North Carnation	761	44,000	23,300	22,100	89,400	1.17	0.18	2,091,960	321,840	89,400	1.17	o.1a	2,091,960	321,840
South Carnation	762	147,000	19,600	29,300	195,900	1.17	0.18	4,584,060	705,240	160,000	1.23	0.19	3,936,000	608,000
Topaz		37,300	11,500	22,900	71,700	1.02	0.17	1,462,000	243,780	61,000	1.08	0.18	1,317,600	219,600
Total		462,850	307,700	193,450	947,560	1.31	0.20	24,831,320	3,788,820	841,100	1.45	0.22	24,432,100	3,667,560
Tons are short tons (	2000 1	bs = 907.2  kg	)											

Table 6.3.1. Sunday Mine Complex historic ore reserves by Union Carbide as of EOY 1988 versus J. Hollingsworth - June 1989 revision



Figure 6.3.1. UMETCO total area covered by depletion units for the 1988 EOY reserve estimate (from Table 6.3.1 above).

Union Carbide was a pre-eminent long-term owner and operator of mines throughout the UMB. Their ability to manage all aspects of their mines, including reserves, was to the standards of the industry at the time. However, the reserve estimates shown in Table 6.3.1 predates the Canadian National Instrument 43-101 requirements and therefore are not to be relied upon.

A later historical reserve estimate was made in 1996 by consultants to International Uranium Corporation during their purchase of the SMC from Energy Fuels Nuclear

As part of the IUC (Registrant, below) purchase of the Energy Fuels Nuclear (EFN) uranium assets in 1996, IUC commissioned Saskatoon Mining & Mineral Services (S2MS) to conduct a due diligence program. That review, dated November 1996, and titled "Acquisition Study of Energy Fuels Nuclear Inc." included the SMC. Portions of the review are available online via the U.S. Securities and Exchange Commission's EDGAR website (SEC Edgar on-line, 1999).

The part of the 1996 review document (plus later additions by unknown persons) relevant to the SMC is quoted below:

"The geological mineral deposits of the Sunday Mine Complex, calculated by the Registrant, are 845,400 tons grading approximately 0.21% U(3)O(8) and approximately 1.40% V(2)O(5) containing 3,493,700 pounds of U(3)O(8) and 23,612,300 pounds of V(2)O(5). As of September 30, 1998, the Registrant had produced 37,100 tons of ore from these deposits.

Prior to the acquisition of the Energy Fuels assets, the Registrant asked S2MS to evaluate the Sunday Mine Complex reserve estimates. Due to time constraints, an assessment of the reserve by S2MS focused on the West Sunday area and new areas immediately available to new development from the West Sunday workings. These are the Le May zone, Leonard Clark zone and West Sunday zone itself. In addition, S2MS spent some time attempting to verify the mineral deposit estimate for the Sunday and Carnation zones but found that there was not sufficient data to verify all these mineral deposits, in the time available.

The final probable mineral deposits for the Sunday Mine Complex zones calculated by S2MS, including approximately 50,000 tons from the Carnation zone, were 318,190 tons grading approximately 0.25% U(3)O(8) and approximately 1.69% V(2)O(5) containing 1,594,690 pounds of U(3)O(8) and 10,682,050 pounds of V(2)O(5).

The overall total for the Le May, Leonard Clark and West Sunday zones compares with 235,000 tons grading 0.24% U(3)O(8) quoted for the same areas by Energy Fuels which makes the S2MS estimate 14% higher in tons and 19% higher in contained pounds of U(3)O(8). As a result, S2MS has concluded that the estimates made by Energy Fuels for these areas were slightly conservative and are realistic numbers for planning future mining operations".

#### SUNDAY MINE COMPLEX - MINING

#### MINABLE RESERVES

The Registrant's mineral deposit for the Sunday Mine Complex includes a total of 845,400 tons at 1.40% V(2)O(5) and 0.21% U(3)O(8). As discussed above, only a portion of the deposit areas addressed in that statement were independently verified by S2MS and included in the S2MS Report. Based on the mineral deposits that S2MS was able to verify with the available data, minable reserves as calculated by S2MS were 221,579 tons grading approximately 0.24% U(3)O(8) and approximately 1.67% V(2)O(5), containing 1,070,124 pounds of U(3)O(8) and 7,393,822 pounds of V(2)O(5). "

The report does not explain the methodology or data used to determine the values above. Because these estimates predate the NI 43-101 regulations, they are not considered to be NI 43-101 compliant reserve or resource estimates and are not to be relied upon. It is not known if the Sunday Mine Complex as described has the same boundary as the SMC in this Technical Report. No other historical estimates are known to exist. It is important to remember that at least several years of mining has occurred after the 1989 and 1996 estimates above were made (see 6.4 Production, below).

#### **6.4 Production**

Detailed continuous production records for the mines in the SMC are not available. One estimate for the SMC area, is 379,600 tons (341,640 tonnes) with no grade given, for the period 1960-1980 (Shawe, 2011). Union Carbide mined the SMC for most of the 1970's and into the mid 1980"s. The average desired grade from mines for the Union Carbide mill in Uravan was 0.20% U3O8. As a baseline, if the SMC shipped at this grade for the period

above, then it would have produced about 1,366,500 pounds (621,136 kg) of uranium and 8,199,000 pounds (3,726,818 kg) of vanadium.

A discussion of the SMC depletion units mentioned in the Hollingsworth report, above, observes that the production from some of the units (9 of 31) for the period 1978 to 1984 totals 445,906 short tons at a grade of 0.19% for a total of 1,690,913 pounds U3O8

Another estimate, from a well-experienced mine contractor active for Denison Mines at the SMC in the mid-2000's, is that 4,000,000 to 5,000,000 pounds (1,818,181 – 2,272,727 kg) may have been produced from the SMC over the years (Davis, 2015). According to Davis, his average grade shipped to the White Mesa mill was 0.183% U3O8 with an approximate 6:1 vanadium to uranium ratio. He stated that records found in the old Sunday Mine office, left on site by Union Carbide, indicated that grades found in some areas of the mine exceeded 0.40% U3O8.

Denison Mines						
Mine	2007	2008	2009	Totals/Mine	Total lbs	Total kgs
Sunday/St. Jude						
Tons (st)	10,879	27,497	16,073	54,449		
%U3O8	0.16	0.19	0.18	0.18	197,164	89,620
%V2O5	0.86	1.04	0.97	0.98	1,070,873	486,760
Topaz						
Tons (st)	7,753	9,707	1,506	18,966		
%U3O8	0.16	0.13	0.09	0.14	52,759	23,981
%V2O5	0.86	0.7	0.48	0.75	283,707	128,958
West Sunday						
Tons (st)	16,526	30,121	26,132	72,779		
%U3O8	0.1	0.21	0.18	0.17	253,635	115,289
%V2O5	0.92	1.13	0.97	1.02	1,491,774	678,079
Totals/Yr						
Tons (st)	35,158	67,325	43,711	146,194		
%U3O8	0.13	0.19	0.18	0.17	503,558	228,890
%V2O5	0.89	1.03	0.95	0.97	2,846,354	1,293,797
Total lbs	92,674	256,235	154,649	503,558		
Total kgs	624,549	1,388,570	833,235	2,846,354		

Lastly, the Table below lists the Denison Mines ore production from the SMC mines

Table 6.4.1. Production from the Denison Mines SMC for the years 2007-2009 (extracted from EFR 2012 Annual Information Form. Pounds/kilograms U3O8 & V2O5 added by the author of this report)

While all of the above estimates or records are incomplete over time, they do signify that the SMC was a major producer of uranium and vanadium in the UMB.

## **Item 7: Geological Setting and Mineralization**

Because of the presence of uranium and vanadium in the region, the project area, along with parts of southwest Colorado and southeast Utah, has been intensively studied by both public and private-sector investigators. Principally leading the public sector workers were geologists of the USGS and of the Atomic Energy Commission (AEC) during the 1940's through the 1970's. Seminal geologic work was done in the Uravan Mineral Belt (UMB), in which the SMC lies, by Fischer, R. P. and Hilpert, L. S., 1952, and by F. W. Cater, C. F. Withington, E. M. Shoemaker and others, 1970. Cater's work is presented in U. S. Geological Survey Professional Paper 637, 1970, which is used as a principal source for the following discussion.

#### 7.1 Regional Geology of the Area

The region is characterized by a long period of sedimentary deposition that started in Pennsylvanian marine environments but transitioned in Permian times to a continental environment, which, with a few hiatuses, persisted until the late Cretaceous, when a return to a marine depositional environment occurred. Post-Cretaceous lithologies include Tertiary (?) conglomerates and fanglomerates found in some valleys plus Quaternary sediments such as widespread wind-deposited and sheet-wash material, terrace gravels, and alluvium. Some of the early marine sediments are evaporates that were localized by underlying basement weakness such as faults or folds. The Tertiary laccolithic intrusives of the La Sal Mountains are located about 35 miles (56 km) to the northwest.

Structurally, the region is dominated by the broad northwest-trending uplift that underlies the Uncompaghre Plateau, which occupies the northeast portion of the area. In addition to the uplift, the upward movement of the lower density evaporates influenced the thickness and extent of overlying lithologies as well as creating a series of parallel, salt-cored, collapsed anticlines with corresponding intervening synclines that repeatedly occurred over geologic time.

#### **7.2 Geology of the Property**

#### 7.2.1 Lithology

The following is largely paraphrased from Cater, (1955). The lowest formation exposed on the property as mapped by the USGS is the Salt Wash Member of the Upper Jurassic Morrison Formation (Jms). It is exposed at several small areas at the southeast and northwest portions of the property block. The member consists as a series of thick, resistant ledges and benches ... interbedded with shale and mudstone. Full thickness ranges from 320 to 380 ft (98 to 116 m). Sandstone commonly occurs as strata traceable as ledges for considerable distances along the outcrop, but within each stratum individual beds are lenticular and discontinuous: beds wedge out laterally and other beds occupying essentially the same stratigraphic position wedge in. Ripple marks, current lineations, rill marks and cut-and-fill structures indicate that the Salt Wash was deposited under fluvial conditions. The sandstones, particularly the upper sandstone lens of the Salt Wash Member, are the main uranium and vanadium bearing horizons in the UMB as well as the SMC area. Overlying the Salt Wash is the Brushy Basin Member of the Morrison Formation (Jmb). The Brushy Basin, which varies in thickness from about 350 to 420 ft (107 to 128 m), consists predominantly of varicolored bentonitic shale and mudstone, with intercalated beds and lenses of conglomerate and sandstone, and a few thin layers of limestone. The conglomerates, lensoidal in nature, occur just above the contact with the underlying Jms. Elsewhere in the UMB, the conglomerates will occasionally host uranium mineralization.

Conformably overlying the Brushy Basin is the lower Cretaceous Burro Canyon Formation (Kbc). This formation, which is about 190 to 240 ft thick (58 to 73 m), consists of mediumgrained to conglomeratic cross-bedded sandstones with lesser amounts of mudstone and shale. The Burro Canyon characteristically crops out as a cliff or a series of thick, resistant ledges.

Unconformably overlying the Burro Canyon is the late Cretaceous Dakota Formation (Kd). Gray, yellow and buff flaggy sandstones interbedded with carbonaceous shale and coal characterize the Dakota. The Dakota attains a thickness of about 200 feet (61 m) in the greater project area.

Conformably overlying the Dakota Formation is the Upper Cretaceous Mancos Shale. This is a dark-gray soft homogeneous fissile rock that erodes either to smooth, rounded topographic forms or to a badlands. The downwarped Mancos Shale in the center of Big Gypsum Valley is probably about 1,600 ft (487 m) thick.

Some small areas of the property, mostly located along the slope break between the valley floor and the south ridge, are covered with thin veneers of Quaternary alluvium (Qal) and landslide debris (Qls)

#### 7.2.2 Structure

The property is located on the south flank of Big Gypsum Valley, which is a collapsed saltcored anticline. Several valley parallel (NW-SE) normal faults traverse the claim block dropping younger formations against older ones. Figure 7.2 is a cross-section from GQ-69 that transects the property, and Figure 7.3 is the stratigraphic column for both Figures 7.1 and 7.2



Figure 7.1. Sunday Mine Complex against geology. Geology from USGS GQ 69. Grid is Colorado State Plane, Zone 503



Figure 7.2. Geologic cross-section of the SMC area (from USGS GQ-69)



Figure 7.3. Sunday Mine Complex stratigraphy. Principal horizon for uranium-vanadium mineralization is Jms. (from USGS GQ 69).

#### 7.2.3 Alteration

Typical Salt Wash alteration of light gray, reduced sandstones and green mudstones were noted adjacent to the many workings located around the property. Of an uncertain relationship, but notable, were several areas of sandstone containing numerous blebs of bitumen or "dead oil" associated with the movement of oil field brines through the rock. These hydrocarbon concentrations can be a reductant to oxidizing metal-carrying fluids (Hahn and Thorson, 2005).

#### 7.2.4 Mineralization:

According to Cater (1955), while deposits containing uranium, vanadium and radium were first discovered in the Roc Creek area of the UMB, about 22 miles (35.4 km) north of the Project Area, intensive mining of these ores did not begin in the Plateau region until 1911 when radium was the primary element of interest. This ceased after the Belgian Congo pitchblende deposits were discovered in 1923. Plateau mining resumed in about 1937, when vanadium became of interest and then since the early 1940's when uranium became ascendant. Except for two minor periods of activity, one in the 1990's and the other in the mid-2000's, the UMB has been fairly quiet.

Mineralization is associated with lenticular, channel-type upper Salt Wash light brown to light gray medium to fine grained sandstones with thicknesses greater than 30 feet, with material present as flakes or trash pockets and/or accompanying green or gray mudstones above or below the sandstone beds (Carter and Gualtieri, 1965).

Shawe (2011) in the abstract to his Prof. Paper 576-F, discusses the likely origin and formation of the uranium-vanadium deposits of the Slick Rock District specifically, and which can be more generally extended to the UVB. He proposes

"...three types of lithologic facies: 1) a reduced "carbon facies", 2) an oxidized "red-bed facies", and 3) a chemically reduced "altered facies. Each of the three facies is significant in the genesis of the ore deposits. Much of the Morrison Formation is of the red-beds facies; such rocks in the upper Brushy Basin Member were the likely immediate source of uranium in the deposits. The redbeds facies formed near the ground surface not long after sediment deposition. Carbon facies in the ore-bearing sandstone of the underlying Salt Wash Member provided the chemically reducing conditions that favored accumulation and (or) precipitation of ore components. Altered-facies rocks, developed by alteration of both red-beds facies and carbon facies as a result of introduction of an extraneous solution at a much later time, interacted with water in carbon facies to form the present geometry and mineralogy of the ore deposits. Uranium from volcanic ash in the Brushy Basin was moved incrementally during a protracted period, probably mostly along faults and partly by compaction from weight of overlying Cretaceous sediments, into the underlying ore-bearing sandstone where the uranium was extracted by adsorption upon humates formed from decaying plant material in carbon facies rocks. Biogenic sulfide developed in the zones of decaying plant material during the early stages of burial. Introduced altering solution, following deep burial of the rocks many millions of years later, encroached through permeable fracture zones and sandstone units into the local zones of carbon facies to establish a more or less stable interface between introduced water and formation water in a zone surrounding the carbonaceous material. Chemical differences between the solutions in carbon facies and in encroaching altered facies resulted in precipitation of uranium-vanadium minerals, as well as metal sulfides and selenides.

Detailed studies of the forms, internal textures, mineralogy, and chemistry of the Salt Wash uranium-vanadium ore bodies show convincingly that the ores were precipitated at an interface between formation water (strongly reducing carbon-facies fluid) and introduced water (less reducing altered-facies fluid). Inferred contrasting chemical contents of the two fluids (including mostly uranium, uranogenic lead, and sulfur in formation water and mostly vanadium, titanium, iron, chromium, copper, silver, molybdenum, nickel, and common lead in introduced water) account for the resulting chemistry of the deposits. The specific elements also indicate the sources of the elements. The presence of Liesegang-ringlike forms in some of the roll ore bodies suggest diffusion, likely through a gel, as part of the process of deposition.

Magmas which emplaced the La Sal Mountains laccoliths in Utah northwest of Slick Rock, in early Tertiary time, expelled fluids at depth which heated Paradox Formation waters and drove them upward along favorable structural zones into the Slick Rock district as well as elsewhere in the Uravan mineral belt. The reducing waters from the Paradox, with an increment of water expelled from magmas, served as the altering fluids which leached elements (vanadium, titanium, and other elements) from sedimentary rocks, or carried elements from the magmas (copper, silver, selenium, and other elements) that were deposited at the interface between strongly reducing formation water in the Salt Wash Member and less reducing introduced water. Regional similarities of lead isotopes, chemical compositions, and ages of mineral deposits and igneous bodies within and adjacent to the Colorado Plateau, indicate that the ores were deposited in their present form during latest Oligocene".

Other hypotheses for the source of the mineralization include uranium derived arkosic sediments in underlying terrigenous rocks, and from hydrothermal solutions associated with intrusive rocks. (Finch, 1967). Of the hypothesis, Shawe's is, with various modifications, the most widely believed. Uranium once liberated from its' source travelled as a mobile ion in originated meteoric waters in fluvial sandstones until localized by reducing environments created by carbon pockets, pyritic zones and possibly brines or gases associated with hydrocarbon maturation

Uranium and vanadium occur frequently occur together in the UVB with ratios that range from 1:5 to 1:10 (Fisher and Hilpert, 1955). Energy Fuels internal document (2013), show the SMC U:V ratio is 1:5.36. Maps prepared by Denison Mines (USA) show a uniform 1:6 ratio. Twenty randomly selected drill holes with vanadium values and shown on the 1980's era UCC maps were taken from over the expanse of the property. Only holes with intervals >1.0 ft (0.33 m) and withU3O8 values >0.10% were selected. The results show U:V ratios that vary from 1:3.63 to 1:14.00, with a weighted average of 1:7.42. A consistent change in the ratio does not appear to be associated with a change in the uranium grade. Accordingly, the author believes that the Denison ratio of 1:6 is appropriate as a slightly conservative value.

One feature noted at the SMC by UCC and Denison geologists (Hollingsworth, 1989, 2015 and Showalter, 2015), is the presence of a colloquially-termed "red front". This is an important ore control that marks the change from red oxidized to gray unoxidized sandstone in the mineralized horizons.

#### 7.2.4.1 A Note Concerning Disequilibrium

An issue always of concern to a uranium program using beta/gamma detectors is that of disequilibrium. It requires about 300,000 years after the deposition of the uranium to fully develop the chain of decay products (Bailey and Childers, 1977). It is these decay products, not the actual uranium, that emit the gamma rays detected by the detectors. The uranium and its decay products have differing solubility's. If the uranium deposit is too young or if chemical leaching has removed uranium or one of its decay products, radioactive disequilibrium is the result. Disequilibrium is common in uranium deposits and must always be taken into account in quantitative considerations.

Disequilibrium was a concern for the historical project operators in the sense that, on occasion, cuttings or mine samples were collected for a chemical assay. Quality Assurance/Quality Control (QA/QC) sampling methods required for NI 43-101 compliant reserves were never used, much less contemplated, by the historic operators

However, generally speaking, the Colorado Plateau sandstone-type of deposits is in equilibrium. Shoemaker, et al (1955) states with regard to the Colorado Plateau deposits "No consideration has been given in this investigation to the radioactive daughter products of uranium that are present in the sandstone-type uranium ores. Paired radiometric and fluorimetric uranium analyses of thousands of samples of the sandstone-type ores from the Morrison formation indicate that the great majority of the ores are nearly in equilibrium. The content of radioactive daughter elements, therefore, tends to be proportional to the content of uranium in the ores." In addition, Shawe, 1976, remarks "Primary uranium deposits on the Colorado Plateau are generally nearly in radioactive equilibrium...."

## **Item 8: Deposit Types**

According to the USGS Bulletin 1693 (Cox, D.P., and Singer, D. A., eds., 1986), the Deposit Model for the project is Model 30c, Sandstone Uranium – Tabular subtype. The following is from Bulletin 1693.

DESCRIPTIVE MODEL OF SANDSTONE U By Christine E. Turner-Peterson and Carroll A. Hodges

APPROXIMATE SYNONYMS Tabular U ore, roll front U.

DESCRIPTION Microcrystalline uranium oxides and silicates deposited during diagenesis in localized reduced environments within fine- to medium-grained sandstone beds; some uranium oxides also deposited during redistribution by ground water at interface between oxidized and reduced ground (see fig. 157).

GENERAL REFERENCE Turner-Peterson and Fishman (1986), Granger and Warren (1969).

#### GEOLOGICAL ENVIRONMENT

Rock Types Host rocks are feldspathic or tuffaceous sandstone. Pyroclastic material is felsic in

composition. Mudstone or shale commonly above and/or below sandstones hosting diagenetic ores (see fig. 157A).

Textures Permeable--medium to coarse grained; highly permeable at time of mineralization,

subsequently restricted by cementation and alteration.

Age Range Most deposits are Devonian and younger. Secondary roll-front deposits mainly Tertiary.

Depositional Environment Continental-basin margins, fluvial channels, braided stream deposits,

stable coastal plain. Contemporaneous felsic volcanism or eroding felsic plutons are sources of

U. In tabular ore, source rocks for ore-related fluids are commonly in overlying or underlying

mud-flat facies sediments.

Tectonic Setting(s) Stable platform or foreland-interior basin, shelf margin; adjacent major uplifts provide favorable topographic conditions.

Associated Deposit Types Sediment-hosted V may be intimately associated with U. Sediment-hosted Cu may be in similar host rocks and may contain U.

#### DEPOSIT DESCRIPTION

Mineralogy Uraninite, coffinite, pyrite in organic-rich horizons. Chlorite common.

Texture/Structure Stratabound deposits. Tabular U--intimately admixed with pore-filling humin in tabular lenses suspended within reduced sandstone (fig. 157A). Replacement of wood and other carbonaceous material. Roll front U--in crescentic lens that cuts across bedding, at interface between oxidized and reduced ground (fig. 157B).

Alteration Tabular--Humic acid mineralizing fluids leach iron from detrital magnetiteilmenite

leaving relict TiO2 minerals in diagenetic ores. Roll front--Oxidized iron minerals in rock updip,

reduced iron minerals in rock downdip from redox interface.

Ore Controls Permeability. Tabular--Humic or carbonaceous material the main concentrator of U. Roll front--S species, "sour" gas, FeS2. Bedding sequences with low dips; felsic plutons or felsic tuffaceous sediments adjacent to or above host rock are favorable source for U. Regional redox interface marks locus of ore deposition.

Weathering Oxidation of primary uraninite or coffinite to a variety of minerals, notably yellow

carnotite as bloom in V-rich ores.

Geochemical and Geophysical Signature U, V, Mo, Se, locally Cu, Ag. Anomalous radioactivity from daughter products of U. Low magnetic susceptibility in and near tabular ores.

EXAMPLES Colorado Plateau (Fischer, 1974) Grants, USNM (Turner-Peterson and Fishman, 1986) Texas Gulf Coast (Reynolds and Goldhaber, 1983) USWY (Granger and Warren, 1969)



Figure 157. Cartoon sections showing: <u>A</u>, Diagenetic mineralization (from Turner-Peterson and Fishman, 1986); <u>B</u>, roll-front mineralization in sandstone U deposits (from Nash and others, 1981).

Figure 8.1. Schematic cross-section through a sandstone-hosted uranium ore body.

The Sandstone Uranium Deposit Model can be an effective tool for exploration at the Project. Fluvial sandstones have recognizable portions, such as channels and overbank deposits. Understanding the detailed nature of these characteristics along with features such as alteration and mineralization allows for a more efficient targeting of potentially economic mineralization.

Figure 8.2 is an example of the morphology of a typical Salt Wash ore body, frequently comprised of a number of ore lenses. These lenses can range from individual units as little as 50 ft (15 m) long and 10 ft (3 m) wide (Hollingsworth, 2015) to aggregate into ore bodies over 1,200 ft (366 m) long to 250 ft (76 m) wide (Shawe, 2011).



Figure 10. Perspective cutaway diagram of the uranium-vanadium ore deposit at the lke No. 1 mine, Incline No. 1, Radium group of mines. Positions of equally spaced cross sections through the cutaway diagram are not shown on the map on plate 8.

Figure 8.2. Example of a Salt Wash ore body (from Shawe, 2011)

## **Item 9: Exploration**

The SMC has a rich history of exploration from the 1950's through 2009, by surface and underground drilling, and by mine drifting. There are many piecemeal, historic, and uncollated, (both temporally and spatially) mine maps that commonly show two of, or all three of the detection methods listed above. EFR, the most recent owner prior to WUC did no exploration, nor has WUC. If UCC kept coherent exploration records, which is likely, it appears that they have not survived the ownership changes since UCC left the scene.

## **Item 10: Drilling**

As mentioned above in item 6.2, exploration and development drilling on the property was contiguous with the mining, at least through the UCC era. The available database records show that at least 1,419 holes have been drilled on the property. This is an incomplete list, as an examination of the available maps and cross-sections shows a number of holes that are not in the database. A best estimate for total distance drilled is about 850,100 ft (259,175 m).There is no extant record of IUC drilling, and Denison Mines(USA) apparently drilled only in 2009 - 59 holes for a total of 35, 870 ft (10,936 m). In addition, three monitoring wells, for a total of 2,460 ft (750 m) were drilled (and logged) in 2012 by Denison Mines just before the sale of the property to EFR.

Surface drill methods were core and air-rotary. Anecdotal evidence suggests that core was more common in the 1950's, with air-rotary supplanting core by the mid-1970's. Both

types of holes were routinely surveyed for radioactivity and deviation. No 43-101 complaint Quality Assurance/Quality Control (QA/QC) protocols were followed for physical samples. Both company and commercial downhole geophysical loggers routinely calibrated their probes at the Atomic Energy Commission/Department of Energy test pits in Grand Junction, CO.

No original or duplicate of lithologic or downhole geophysical logs are available. Only digital databases are available as compiled by previous owners. A database may be the result of work by more than one owner. In some cases the piecemeal maps show handplotted holes with deviation tracks, whereas the digital database lists the holes as vertical. A review of the piecemeal maps and the 2009 Denison drilling indicates that drill holes tend to drift from between NNW and NNE in direction and between 20 to 125 ft (6 to 38 m) in distance, depending on location and total depth drilled.

Notwithstanding the above notes and inconsistencies, which generally deal with data preservation through time, portions of the SMC has been well drilled by reasonably competent operators.

## Item 11: Sample Preparation, Analyses and Security

As far as is known, the historic drilling followed the conventions of the time. For core drilling: 1) hollow drill rods and bit with an inner core barrel were used, 2) after boring the interval that would nominally fit into the core barrel, the barrel was retrieved either by tripping out the rods or by the use of a wireline retrieval system, 3) In the early days, once on the surface, the core was usually lithlogged on site by a geologist and the desired intervals were removed for a wet chemical assay, and 4) shallow holes were surveyed from the surface (direction, inclination by pocket transit) and deeper holes surveyed by a tool lowered via the drill rods. By the late 1960's, downhole geophysical tools were slim enough to lower into core holes. This accelerated the shift from coring to air-rotary and coring was increasingly used for difficult ground or to obtain a physical sample of the mineralized material.

Air rotary drilling followed a somewhat similar path: 1) rotary single-tube drill rods were used to bore the hole , 2) drill cuttings gathered from the rig return circulation were collected for lithology and placed adjacent to the drill pad in one to five foot intervals of co-mingled material from that interval, and 3) the hole was wireline electric logged for natural gamma, plus self-potential, resistivity, conductivity, deviation, and occasionally neutron-neutron as warranted or as the probing tool could provide. Natural gamma was for the calculation of eU3O8 grades and the other curves were for location, lithologic and water table information.

Rotary samples collected for chemical analysis were typically taken from the cutting piles, sacked and sent to either an assay lab or a mill lab. The use of standards, duplicates or barren samples as per NI 43-101 protocols was not a standard of the time. At the time, there were a number of commercial electric logging companies available for hire and they generally calibrated their gamma probes as noted above or similar test pits in Casper, WY.

The 2009 drilling by Denison appears from the available records to have been conducted

in a reasonably proficient manner. The data is digital, but that is the current standard. There is no evidence available that physical samples were taken, or if so, NI 43-101 compliant QA/QC policies were followed.

## Item 12: Data Verification:

The data for the resource estimate come from multiple sources through a series of successive property owners. The principal property owners that actually drilled and mined on the SMC, Climax Uranium, Union Carbide, IUC, and Denison, were known to be reasonably competent in the basics of their work. Surface drill holes were surveyed for both surface and downhole locations, holes were geophysically and electrically logged (gamma for eU308, resistivity, spontaneous potential and in some cases neutron-neutron), and the data entered onto maps or into software programs as befitting the standards of the day. Equally, mine workings were surveyed and accurately plotted on maps or in software programs. However, after reviewing the data made available to the author, it is clear that gaps, hiatuses and errors have worked their way into the data over time. Accordingly, the data is adequate for geologic resource estimates with the appropriate qualifiers, but not for mining reserve estimates.

### Item 13: Mineral Processing and Metallurgical Testing

According to a previous operator, the production from the historic mining was processed at several different mills depending on the owner at the time. This varied from the Climax Uranium mill in Grand Junction, CO, the UCC mill in Uravan, CO, and lastly the White Mesa mill located near Blanding, UT. The first two mills have been eradicated and reclaimed. Records from all three mills are not obtainable and may no longer exist. WUC has not conducted any mineral processing or metallurgical testing as related to conventional uranium milling.

#### **Item 14: Mineral Resource Estimates**

The mineral resource estimate was made using the 1,419 drill hole database discussed in part or its' entirety in Items 6, 10 and 12. Based on the study results in this report, the Sunday Mine Complex is classified as a resource, according to the following definition from NI 43-101 Guidelines, which references the Canadian Institute of Mining, Metallurgy and Petroleum CIM Definition Standards on Mineral Resources and Mineral Reserves. The CIM definitions are provided below:

#### **14.1 Mineral Resources**

Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource.

A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.

<u>Inferred Mineral Resource</u> - An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.

<u>Indicated Mineral Resource</u> - An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such that the tonnage and grade of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.

<u>Measured Mineral Resource</u> - A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production

planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such that the tonnage and grade of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.

#### 14.2 Sunday Mine Complex Resource Estimate

The Sunday Mine Complex mineralization displays good geologic continuity, as demonstrated by drill hole results displayed on the available plan maps and cross sections. Thickness and grade continuity within the Project Units also is good. However, as is typical with the Salt Wash Member mineralization in the area, continuity is much stronger horizontally than vertically. For the SMC resource, the classification strategy was based on the following criteria.

#### Measured Resources

- 1) Drill holes with a Grade x Thickness (GT) value of >0.10 based on a minimum thickness of 1.0 ft (0.33 m) and a minimum undiluted grade of 0.10 % eU3O8, and
- 2) An area of influence within a 50 ft (15.24 m) radius of a drill hole that meets the criteria of 1) above, and
- 3) Within the overall thickness of sandstone beds that host the SMC mineralization exploited by the mine workings

Indicated Resources

1) Drill holes that meet the criteria for Measured Resource and that are within 200 ft (61 m) of each other, with the measured tons subtracted from the larger area. Grade and thickness is a weighted average of the bounding holes.

The area of influence method used for the measured and indicated resource estimate is informally referred to as "wheel and pulley" and has been a common way to historically estimate reserves or resources on the UMB (Figure 14.1).

#### Inferred Resources

1) An area of influence are determined by defining a favorable area within an area of drilling that has detected ore holes, mineralized holes and barren holes. The ratio of ore holes to total holes drilled and the use of that ratio to reduce a favorable area into an area of inferred material. That inferred area is converted to tons and pounds by a weighted average undiluted grade and thickness of the enclosed ore holes. Then, the measured and indicated resource values that exist within the inferred areas are subtracted from the inferred tons and pounds. This method is called the

"Uravan Method" (Figure 14.2). It was commonly used in the UMB by UCC, and is briefly described by Motica (1968). While historically used to define reserves, its use has been limited in this report for only inferred resources. The Uravan Method, while it has its limitations, was considered by UCC to be a good workable method that withstood the test of time (Hollingsworth, 2015).



FIG.40. Reserve blocks and mine workings in a large, discontinuous uranium ore body.

Figure 14.1. Example of "wheel and pulley" area of influence estimation method (IAEA, 1985)

Given the nature of the historic drill hole and mine data, and the preservation of that data over time, the construction of detailed geologic sections through the mineralized lithologies is not possible at this point. In addition, the focus was on areas proximal to distal to the workings as the data quality extent concerning the mine workings (location of void spaces, mineralization grades, grade of material removed) preclude confidence at any level.



Figure 11.

Illustration of method of outlining area underlain by total reserves, including positive and indicated ore, based on drilling on 200-foot centers (from Geology Department Manual, 1961).

Figure 14.2. Example of the "Uravan method" area of influence estimation method (Hollingsworth, 1989).

A tonnage factor of 14 ft3 per short ton (sp.gr. 2.3) was used for conversion from volume to tons and a 50 ft (15.24 m) buffer was drawn around all the mine workings to allow for underground, surface and downhole survey ambiguities, which can occasionally be significant. Holes that appeared to enter that buffer zone were either downgraded or eliminated from the resource depending on individual circumstances. The drill data and historic practices indicates that all the drill holes were started as vertical holes and as they drifted, tended to turn perpendicular to dip. All mineralized drill intercepts are presumed to be true thickness.

Figure 14.3 shows the locations of the estimated resources and Table 14.1 is a summary of each area in the respective categories.



Figure 14.3. SMC showing the various resource blocks. Note that the inferred areas shown are reduced by the ore hole to total holes ratio for those areas, which can vary significantly.

SMC Undiluted Geologic R	esource Summar	y - This Report	t						
	Measured			Indicated			Inferred		
Inferred Area ID	Tons (st)	Lbs U3O8	Lbs V2O5	Tons (st)	Lbs U3O8	Lbs V2O5	Tons (st)	Lbs U3O8	Lbs V2O5
TPZ-1	8,293	69,291	415,748	890	5,031	30,183	43,577	421,617	2,529,701
TPZ-2	8,044	30,145	180,870	1,752	5,110	30,661	3,941	103,213	619,278
TPZ-3	17,907	70,772	424,632	2,904	7,943	47,656	9,525	35,348	212,086
SND-1A	25,796	90,851	545,105	242	872	5,235	98,532	473,894	2,843,365
SND -1B	8,372	38,792	232,751	0	0	0	15,030	173,221	1,039,328
SND-2 DBK	15,435	94,119	564,713	1,844	14,129	84,776	41,954	320,720	1,924,322
GMG-1	19,125	111,367	668,199	4,770	28,030	168,180	1,115	32,941	197,644
GMG-2	2,760	11,299	67,795	0	0	0	1,288	7,319	43,913
DV-1	13,091	69,510	417,059	712	2,961	17,764	3,336	40,567	243,402
DV-2	9,237	57,568	345,407	1,562	7,760	46,563	41,545	276,478	1,658,867
SJ-1	1,389	6,929	41,574	0	0	0	197	8,939	53,637
SJ-2	2,991	14,870	89,220	201	604	3,624	2,305	4,317	25,900
Outside inferred Areas	55,803	269,638	1,617,826	96	242	1,454	2,259	7,507	45,043
Totals	188,243	935,150	5,610,899	14,974	72,683	436,097	264,604	1,906,081	11,436,484
Avg. Grade		0.25	1.49		0.24	1.46		0.36	2.16
Measured and Indicated	Tons (st)	Lbs U3O8	Lbs V2O5	Grade U3O8 (%)	Grade V2O5 (%)				
	203,217	1,007,833	6,046,996	0.25	1.49				

Table 14.1. Undiluted Geologic Resource Summary for the SMC

The measured and indicated resource grades are comparable with historic estimates as well as the average undiluted grade of the UMB. The inferred grade is higher due to the use of only the ore holes (GT >0.40), as per convention with the Uravan Method, whereas the measured and indicated resource values include subore (GT > 0.10 <0.40 with a grade > (GT = 0.10 < 0.40)

0.10 and a thickness > 0.10) holes. The inferred zones SND-1A and SND-1B are down dip of the static water table.

The average grades listed in Tables 6.3.1 and 6.4.1 are lower than the undiluted geologic resource grades in Table 14.1 due to the influence of mine-related dilution.

## **Item 15: Mineral Reserve Estimates**

The resources described in this report do not qualify as reserves.

## **Item 16: Mining Methods**

Mining methods have not been addressed. The historic mining on the property, was originally by rail, then converted to a trackless underground mine in the 1970's. Ore extraction used jackleg drilling and a random room and pillar mining method. Split shooting of ore and waste to maintain grade was common.

## Item 17: Recovery Methods

Traditionally in southwest Colorado and southeast Utah, uranium and uranium-vanadium deposits were owned or controlled by mining companies of various sizes. Some mines were controlled by the companies that owned the mills, but many mines had owner/lessees that shipped their ore to the regional mills. To which mill to ship depended on the toll contracts and the mineralogy of the uranium and host rocks.

The mills were conventional surface facilities that processed the ore to obtain the uranium. The Nuclear Regulator Commissions' web page <u>http://www.nrc.gov/materials/uranium-recovery/extraction-methods/conventional-mills.html</u> has a description of conventional milling:

#### **17.1 Conventional Uranium Mills**

Conventional milling is one of the two primary <u>recovery methods</u> that are currently used to extract <u>uranium</u> from mined ore. A conventional uranium mill is a chemical plant that extracts uranium using the following process:

- 1. Trucks deliver uranium ore to the mill, where it is crushed into smaller particles before being extracted (or leached). In most cases, sulfuric acid is the leaching agent, but alkaline solutions can also be used to leach the uranium from the ore. (In addition to extracting 90 to 95 percent of the uranium from the ore, the leaching agent also extracts several other "heavy metal" constituents, including molybdenum, vanadium, selenium, iron, lead, and arsenic.)
- 2. The mill then concentrates the extracted uranium to produce a material, which is called "<u>yellowcake</u>" because of its yellowish color.

3. Finally, the yellowcake is transported to a <u>uranium conversion</u> facility, where it is processed through the <u>stages of the nuclear fuel cycle</u> to produce fuel for use in nuclear power reactor

Over time, the SMC has shipped its ore to mills in Grand Junction, CO, Uravan, CO and outside Blanding, UT. Mill records regarding the SMC ore characteristics, head grades and recoveries are not available and may no longer exist.

## Item 18: Project Infrastructure

As befitting a mine that has produced in the recent past, the SMC has a robust infrastructure. Roads are all-weather, electric power is grid-tied, and sufficient water is present. Some of the infrastructure will require permits to use, and the status of those permits is unknown.

## Item 19: Market Studies and Contracts

WUC has not conducted any market studies and has no contracts for the delivery of uranium ore from the project.

## Item 20: Environmental Studies, Permitting and Social or Community Impact

The SMC was originally permitted as individual mines from 1979 to 1981 (CO DRMS website, 2015).

From the State of Colorado, Division of Mining Reclamation and Safety's perspective, all the applicable mining permits have been transferred from EFR to Pinion Ridge Mining Company, LLC, a WUC subsidiary (Oswald, 2015). The permits have the required Environmental Protection Plans and are fully bonded. Oswald states that some relatively minor additional permit items need to be completed before ore can be brought to the surface, but he estimates that it would not take a long time to restart.

The BLM, as the Federal land representative, states that all the permits have been transferred to PRML as well (Blair, 2015). However, there is a question on a 2009 Environmental Assessment (EA) report submitted by Denison Mines that was appealed by an opposition group and remanded back to the BLM by a judge for the EA to address of certain additional environmental concerns. That EA has never been formally resubmitted to the BLM. The timeline for this issue is unknown.

## **Item 21: Capital and Operating Costs**

Capital and operating costs have not been addressed.

## Item 22: Economic Analysis

No economic analysis has been performed.

## **Item 23: Adjacent Properties**

Contiguous on the west southwest is another ex-Union Carbide property, the Burros Mine. Currently controlled by Uranium Energy Corporation and named the Slick Rock property, it shares much in common with the SMC concerning mineralization trends and styles. In April 2014, UEC released a Technical Report about the property. The report estimated that the Slick Rock Property has an Inferred Mineral Resource of about 2,549,000 tonnes at an average grade of 0.228% eU3O8 (using a 0.15% eU3O8 cut-off) or about 11.6 million pounds of uranium. Using a 6:1 vanadium to uranium ratio yields about 69.6 million pounds of V2O5.

The author of this report has been unable to verify the information and that the information is not necessarily indicative of the mineralization on the SMC property. The Slick Rock Technical Report used a spatially inconsistent drill hole database and computer modeling based on certain assumptions to calculate the resource estimate.

While indicative of the strong mineralization trends shared by the SMC and Slick Rock properties, the assumptions and computer techniques used in the Slick Rock Report are not widely shared nor considered particularly relevant by those with experience in the UMB.

## **Item 24: Other Relevant Data and Information**

None known.

## **Item 25: Interpretation and Conclusions**

The Sunday Mine Complex is an advanced stage mine property with a significant drilling and production history. Mining and drilling occurred contemporaneously from the 1950's through the mid 1980's. From the mid-1980's to the present, mining and drilling occurred only sporadically, typically when uranium or vanadium prices were high. The last mining interval was from 2006 to 2009, and based on the available records, only in 2009 did any drilling take place since mid-1980.

# A 43-101 compliant resource has been calculated for the SMC by this report, and is shown below:

Sunday Mine Com	ort							
Measured			Indicated			Inferred		
Tons (st)	Lbs U3O8	Lbs V2O5	Tons (st)	Lbs U3O8	Lbs V2O5	Tons (st)	Lbs U3O8	Lbs V2O5
188,243	935,150	5,610,899	14,974	72,683	436,097	264,604	1,906,081	11,436,484
Grade (%)	0.25	1.49		0.24	1.49		0.36	2.16
Measured and				Grade	Grade			
Indicated	Tons (st)	Lbs U3O8	Lbs V2O5	U3O8 (%)	V2O5 (%)			
	203,170	1,007,830	6,047,000	0.25	1.49			

Table 25.1. SMC undiluted geologic resource estimate summary

The Inferred grade is higher than the Measured or Indicated grade due to the Inferred estimation method that excludes the subore holes included in the Measured and Indicated estimations.

The Sunday Mine Complex, based on historical records and this 43-101 compliant resource estimate, appears to have very good to excellent potential to host in excess of 3,000,000 pounds of uranium-vanadium resources with characteristics suitable for underground mining. As per Items 15 through 22, an economic assessment of the resource base has yet to be conducted.

## **Item 26: Recommendations**

The author recommends concurrent parallel paths to further investigate the property, with the objective of upgrading the resources to a higher level resource or reserve category.

Path One is to aggressively acquire and compile historic data, convert it from a local survey grid to a known coordinate reference system (this can be harder than it sounds), with the goal of constructing a 3-D computer model of the mineralization with the ability to extract mine voids such as stopes and drifts. With the proper constraints, software programs such as Datamine, and Vulcan, or other similar ones, are suitable for the task. Denison Mines may have completed part of this process. As part of this process, a high priority should be placed on finding documents, maps, or drill hole data showing the location of the "red front" mentioned above in Item 7.

Path Two is a modest 10 hole (+/-), approximate 8,500 total footage (2,950 m) drill program to further evaluate selected areas of the Sunday Mine Complex. These selected areas include the deeper mineralization in SND-1A and SND-1B, as well as the mineralization the TPZ-1.

Path One would cost an estimated \$50,000 to \$100,000, depending on the data availability, coordinate conversion and modeling costs, and how far, if any, Denison Mines got in their work. Estimated time to completion would be three to six months.

Path Two would cost an estimated \$185,500 for a 8,500 ft (2,950 m) program. This is an all-in cost that includes permitting, drilling, electric logging, limited chemical assaying, reclamation and personnel expenses. Drilling would be by conventional, single-tube airrotary methods. Estimated time to completion would be three to six months.

Both paths are subject to revision depending on the discovery of additional historic information, reinterpretations based on computer modeling or unforeseen circumstances.

Total cost of the two paths is estimated to be from about \$235,500 to about \$285,500.

If the paths are successful, then additional phases would be designed and implemented.

## **Item 27: References**

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## Item 28: Signature Page

This report titled "Technical Report on the Sunday Mine Complex, San Miguel County, Colorado, USA" was prepared by Anthony R. Adkins on behalf of Western Uranium Corporation.

Author: Anthony R. Adkins, CPG #8159.

Date: July 8, 2015 Dated at Nucla, Colorado, U.S.A.

nthony R. Colkins

![](_page_40_Picture_5.jpeg)

## **Item 29: Certificate of Qualifications**

I, Anthony R. Adkins, P. Geol., do hereby certify that:

1) I am a presently a consulting geologist with Anthony R. Adkins, P. Geol., LLC, a Colorado registered Limited Liability Corporation whose address is P.O. Box 864, Nucla CO 81424

2) I am a graduate of the Georgia State University (1978) with a B.Sc. degree in Geology

3) I am a Certified Professional Geologist as recognized by the American Institute of Professional Geologists, a Registered Geologist in the States of Idaho and California, a member of the Society for Mining, Metallurgy, and Exploration and the Geologic Society of Nevada.

4) I have worked as a geologist for a total of 38 years since my graduation from university. I have worked on, or reviewed, a number of uranium projects in Colorado, Utah and Wyoming, USA, and in Argentina.

5) I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI43-101") and certify that by reason of my education, affiliation with a professional association (as defined by NI43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposed of NI43-101.

6) I am responsible for the technical report "Technical Report on the Sunday Mine Complex, San Miguel County, Colorado, USA. I have visited the project intermittently over the years and most recently on 6 July 2015

7) I have not had any prior commercial involvement with the Project as it currently located and is now the subject of this Technical report.

8) I am not aware of any material fact or material change with respect to the subject matter of the Technical report that is not reflected in the Technical report, the omission to disclose which makes the Technical Report misleading.

9) I am independent of the issuer applying all of the tests in section 1.4 of National Instrument 43-101.

10) I have read National Instrument 43-101 and Form 43-101Fi, and the Technical Report has been prepared in compliance with that instrument and form.

11) I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files of their websites accessible by the public, of the Technical Report

Dated this 8th day of July, 2015

Anthony R. Adkins