A TECHNICAL REVIEW OF THE APPIA ENERGY CORP. RARE EARTH METAL - URANIUM PROPERTY, ELLIOT LAKE DISTRICT, NORTH-CENTRAL ONTARIO, CANADA

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1. SUMMARY

In a letter dated 1 February, 2007 **Canada Enerco Corporation** ("**CEC**"), of Toronto, Ontario, Canada retained **Watts, Griffis and McOuat Limited** ("**WGM**") to undertake an evaluation of a group of uranium properties (the "**Property**") located in Beange, Buckles, Bouck, Gunterman and Joubin Townships, near the town of Elliot Lake in north-central Ontario. The purpose of WGM's review was to document the historical uranium resource estimates pertaining to the CEC claims, as well as to conceptually explore the conditions that would be required in order for the resources to be economically viable. In an agreement dated 1 November, 2007, Appia Energy Corp. ("**Appia**") optioned the Property from CEC and WGM's contractual responsibilities were modified accordingly.

The above-mentioned townships cover much of the famous Elliot Lake mining camp which produced uranium during the period 1955 through 1996. A total of 362 million pounds of uranium oxide (313.5 Mlbs uranium metal) was produced from 13 underground mines having an average grade of approximately 0.106% U_3O_8 (898 ppm U or 2.12 lbs U_3O_8 per short ton).

During 1948, a modest staking rush occurred in the area now known as the Blind River District. In 1953, geologist Frank Joubin, mining promoter Joe Hirshhorn and their associates staked 1,400 claims covering 56,000 acres precipitating one of the largest staking rushes the country had known until that time. Shortly thereafter, Art Stollery, Fred Jowsey and James Kenmey staked 83 claims on what they considered to be the best remaining ground, an area that had been missed by Joubin. Over the next 5-6 years, two great mining companies started production, Rio Algom Uranium Mines Ltd. after having acquired the small start-up companies Joubin had created, and Denison Mines Limited which had acquired the claims staked by Stollery and his Associates. By the end of 1958, Rio Tinto had seven mines in production supplying 40% of Canada's uranium concentrate production. Denison's share of the total is uncertain, but significant – it had sold nearly $500M of uranium by 1963.

The Elliot Lake area is underlain by the Huronian Supergroup, a southward-thickening, mainly clastic succession with is well exposed north of Lake Huron. It forms as east-west trending belt overlapping onto the southern portion of the Superior Province of the Canadian Shield. The rock succession is divisible into three megacycles, each composed of coarse-grained fluvial sandstones overlain by glacio-marine/lacustrine mixtites and marine/lacustrine siltstone plus shale with a capping deltaic succession. In the Elliot Lake district, uranium deposits are found in quartz pebble conglomerates that make up the lowest part of the lowest cycle. The ore-bearing conglomerate beds are found in the Matinenda

Formation, the basal unit of the Elliot Lake Group. The uranium-bearing conglomerate is a clean, well sorted, coarse-pebble conglomerate which was deposited in a mixed littoral and fluvial-deltaic fan environment. The conglomerate is overlain by and interfingers in a time-transgressive relationship with the shallow-marine McKim Formation. Uranium mineralization is stratabound, showing good consistency in grade and thickness over wide areas, both along strike and down dip. The uranium mineralization is predominantly brannerite and uraninite both of which are readily leachable, and this facilitated high recoveries, typically 95%, in the operating mines.

In the late 1960s and early 1970s, Kerr McGee staked and optioned a large group of mining claims covering key portions of the Elliot Lake basin. A number of surface diamond drill holes were completed in areas not previously tested, or where earlier holes had failed to reach the uranium-bearing horizons. Following the Kerr McGee drilling in the Banana Lake area, Mr. Doug Sprague, P.Eng., Chief Geologist for Rio Algom Ltd. at Elliot Lake, estimated the potential resource in the Banana Lake area at 176 million short tons with a grade of 0.76 lbs U_3O_8/ton over an average thickness of 5.36 m (17.6 feet). This historical estimate was based on a limited number of widely spaced Kerr McGee holes and the fact that the uranium-bearing horizons demonstrated remarkable lateral and down dip continuity over a very large area. Subsequent historical estimates believed to be authored by Doug Sprague, P.Eng., formerly Chief Geologist of Rio Algom and shown on a Rio Algom map (Rio Algom, 1979), were based on mine data as well as a series of deep drill holes completed by Kerr McGee and other exploration companies in other areas of the Property. WGM and Appia have confirmed the drill data on which these estimates were based. Rio Algom's estimates increased the total remaining uranium resource to approximately 200 million pounds of U_3O_8. These historical resources are located in five separate zones in the basin down-dip from past-producing mines as follows:

Zone	Quantity (tons)	Grade (lbs U_3O_8/ton)	Contained U_3O_8 (lbs)
Teasdale Lake	17,458,200	1.206	20,787,200
Gemico Block #3	42,800,000	0.38	16,264,000
Gemico Block #10	20,700,000	0.75	15,525,000
Banana Lake Zone	175,800,000	0.76	133,608,000
Canuc Zone	7,000,000	1.86	13,020,000
Total	**263,758,200**	**0.76**	**199,204,200**

The foregoing historical resources were not estimated in accordance with definitions and practices established for the estimation of Mineral Resources and Mineral Reserves by the Canadian Institute of Mining and Metallurgy ("**CIM**"). As such, the historical resources are not compliant with Canada's security rule National Instrument 43-101 ("**NI 43-101**"), and are unreliable for investment decisions. Neither Appia nor its Qualified Persons have done sufficient work to classify the historical resources as current mineral resources under current mineral resource terminology and are not treating the historical resources as current mineral resources. Nevertheless, most of the historical resources were estimated by mining companies active in the Elliot Lake camp using assumptions, methods and practices that were accepted at the time, and based on corroborative mining experience.

WGM carried out a visit to the Elliot Lake property during 15-16 May, 2007. The geology was reviewed and WGM met with officials of two key Ontario ministries: the Ministry of Northern Development and Mines and the Ministry of the Environment. WGM also successfully tested the possibility of relocating diamond drill holes previously drilled in the central basin by Kerr McGee Corporation ("**Kerr McGee**"), a major US uranium producer.

Central to the recommendations that ensued from WGM's first report on the project, was WGM's belief that Appia's interests would be best served by investing in a basic exploration program consisting of a staged approach to the Elliot Lake property. Appia carried out an exploration program during the winter of 2007-08 that comprised:

- finding and re-surveying the locations of the drill hole collars of key historical holes in the Teasdale Lake and Banana Lake areas;
- data research regarding the Elliot Lake uranium exploration and production history, and compilation of new sources of information from industry sources as well as from business libraries;
- several programs of diamond drilling on the Teasdale Lake and Banana Lake zones that included:
    - deep diamond drilling at Banana Lake with BQ core using selected historical holes as a means of placing wedges above uranium-bearing conglomerates in the central basin in order to cost-effectively gather new intersection data on the deeply buried uranium zones; and,
    - drilling twinned diamond drill holes in the Teasdale Lake Zone to confirm the existing mineralization as reported by previous explorers and as modelled by Sprague in estimating the aforementioned uranium resources;
- a mineral resource estimate on the entire Teasdale Lake zone using a combination of historical holes, Appia holes twinned with historical holes and Appia holes in new locations; and,
- a mineral resource estimate in the vicinity of new intersections gained from Appia holes wedged from existing deep historical holes drilled by Kerr McGee.

In accordance with WGM's recommendations, Appia carried out two programs of diamond drilling between 18 November, 2007 and 12 March, 2008 that confirmed the presence of uranium resources in the areas tested. This drilling outlined NI 43-101 compliant Inferred Mineral Resources in the Banana Lake Zone of 30.3 million tons averaging 0.912 lbs U_3O_8 per ton (27.6 M lbs U_3O_8) based on a 0.6 lb U_3O_8 per ton cut-off grade. Data indicated that grades may be 20% higher than the historical estimates or the uranium-bearing zones may be thicker at similar grades. Appia's diamond drilling also demonstrated that the grade and thickness of the uranium resources increases towards the northwest. WGM revisited the project site during 3-4 June, 2009 accompanied Appia's independent consulting geologist, Mr. Alan MacEachern, formerly Chief Mine Geologist for Denison Mines Ltd. Discussions with Mr. MacEachern and follow-up correspondence resulted in WGM gaining valuable insights into the local geology that are not available in published literature. During this site visit WGM confirmed that the reported exploration work had been completed, and re-examined key intervals of mineralized drill core.

In the Teasdale Lake Zone, Appia's drilling confirmed and enlarged the previous historical resource estimate. WGM has estimated that the zone contains Indicated Mineral Resources of 17.4 million tons averaging 1.10 lbs U_3O_8 per ton and Inferred Mineral Resources of 48.0 million tons averaging 1.10 lbs U_3O_8 per ton. Although the current grade is 10% lower that the historical estimate, 1.10 lbs per ton versus 1.21 lbs per ton, the amount of contained uranium as oxide has increased significantly from the historical estimate of 17.5 M pounds to the current NI 43-101 compliant resources of 19 M pounds (indicated) and 52.7 M pounds (inferred). See Section 17 for details pertaining to this previous estimate.

Appia's uranium resources, estimated using a specific gravity of 3.14 short ton per cubic metre and procedures that are compliant with the guidelines of NI 43-101, are summarized as follows:

Zone	Resource Category	Tonnes ('000)	Tons ('000)	Average Grade (lbs U_3O_8/ton)	Contained U_3O_8 (lbs)
Banana Lake	Inferred	27,501	30,315	0.912	27,638,000
Teasdale Lake	Indicated	15,785	17,400	1.10	19,000,000
	Inferred	43,545	48,000	1.10	52,700,000

Pele Mountain Resources Inc. ("**Pele**") is exploring its Eco Ridge uranium project which is an "Adjacent Property" in the context of NI 43-101. In 2007, its independent consultants estimated that the property contained an Inferred Mineral Resource of 30,045,000 tonnes averaging 1.10 lbs U_3O_8 per tonne (1.0 lbs U_3O_8 per short ton) based on a 0.6 lbs/ton cut-off grade, a minimum mining thickness of 2.44 metres (8 feet), the historical mining practice, and a US $70 per pound price for uranium oxide (Cochrane and Roscoe, 2007). In a subsequent report dated 3 October, 2007, the consultants concluded in a Preliminary Assessment that the project would achieve a pre-tax IRR of 15% based on a long term market price of US$100/lb of uranium oxide (Cochrane et al, 2007). This resource estimate was up-dated in a report dated 5 April, 2011 that reported Indicated Resources of 14.31 Mt grading 0.048% U_3O_8 (0.96 lbs U_3O_8 per ton) and 0.164% total rare earth elements ("**REE**"s) or 3.28 lbs/ton with additional Inferred Resources of 33.12 Mt grading 0.043% U_3O_8 (0.86 lbs U_3O_8 per ton) and 0.132% total REEs or 2.64 lbs/ton (Ciuculescu, 2011). The total contained metal was 15.2 million pounds of U_3O_8 and 51.9 Mlbs of REEs in the Indicated category and 31.4 Mlbs of U_3O_8 and 96.4 Mlbs of REEs in the Inferred category. The resources were based on a cut-off grade of 0.028% U_3O_8 and a long term uranium price of $60 per pound of uranium oxide (the current price is stable at $68). In July, 2011, Pele announced the results of a new Preliminary Assessment for the Eco Ridge Project, including the following key findings based on a 9,400-tonne per day operation with life-of-mine production of 10.7 Mlbs of total rare earth oxides (REOs) and 24.9 Mlbs of U_3O_8 over a 14-year mine life:

- cumulative operating cash flow of US$1.72-billion
- cumulative pre-tax cash flow of US$1.31-billion
- positive NPV of $533 million (at a 10% discount rate)
- internal rate of return (IRR) of 47 percent (47%)
- operating cash cost of US $16 per pound U_3O_8, net of REO credits
- start-up capital costs of US $212 million and sustaining capital costs of US $195 million.

WGM and Appia assessed the Eco Ridge results. Based on the available evidence, it was clear to both Appia's senior geologist, Alan MacEachern and WGM that the Teasdale Zone was likely larger that Eco Ridge deposit and potentially contained a higher grading resource. Appia analysed its uranium-bearing drill core for rare earth elements based on the knowledge that both Denison and Rio Algom produced yttrium as a by-product of uranium mining. Historical information for the Elliot Lake uranium mines does not include rare earth metal data other than some yttrium co-production data that is not specific to individual mines. Although it is likely that the major producers estimated the global rare metal content of the uranium ores, none of this information seems to be is in the public domain. As a result, Appia could rely only on its own drilling and REE assay data for resource estimation, especially since the historical core was unavailable for reanalysis. WGM found that within the zone occupied by the uranium-bearing "reefs", REE mineralization was far more prevalent and blanketed across all of the uranium-bearing horizons.

Subsequent to the initial WGM Mineral Resource estimates, WGM re-estimated the rare earth element ("**REE**") and uranium resources in the Teasdale Lake Zone based on REE data provided from drill core by the recent drilling by Appia, but excluding the historical drill holes for which no REE data was available. The resource was constrained by the geological boundaries indicated by the upper surface of the highest reef and the lower surface of the deepest reef. A further 2.44-metre (8 ft) minimum thickness constraint was also applied. It is important to note that the estimated U-REE resource is a smaller volume (tonnage) of mineralized rock that is contained within the larger U-only resource estimate reported in the foregoing section. The physical dimensions of the WGM rare metal resource area were therefore constrained by a lack of data for much of the Teasdale Zone. Nevertheless, in the area of influence of Appia's drill holes, the Teasdale Zone contained the following Mineral Resources, the estimate for which is effective 18 July, 2011:

Resource Category	Tonnes ('000)	Tons ('000)	TREE (lbs/ton)	U_3O_8 (lbs/ton)	Average Thickness (m)	Contained TREE ('000 lbs)	Contained U_3O_8 ('000 lbs)
Indicated	3,366	3,710	2.92	0.506	9.76	10,852	1,878
Inferred	21,217	23,388	3.62	0.615	7.22	85,895	14,379

The individual REEs that constitute the foregoing resources are individually reported as follows:

Resource Category	Light REE (lbs/ton)							Heavy REE (lbs/ton)								
	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Y
Indicated	0.75	1.33	0.13	0.43	0.07	0.002	0.04	0.01	0.03	0.004	0.010	0.002	0.01	0.002	0.01	0.11
Inferred	0.93	1.64	0.16	0.53	0.09	0.004	0.06	0.01	0.03	0.016	0.012	0.002	0.01	0.002	0.01	0.13

Notes:

1. Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. See section 17.1 for the definitions of Mineral Resources and Mineral Reserves. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
2. The quantity and grade of reported Inferred Resources in this estimation are uncertain in nature and there has been insufficient exploration to define these Inferred Resources as an Indicated or Measured Mineral Resource and it is uncertain if further exploration will result in upgrading them to an Indicated or Measured Mineral Resource category.
3. The Mineral Resources were estimated using the Canadian Institute of Mining, Metallurgy and Petroleum standards on Mineral Resources and Reserves, Definitions and Guidelines prepared by the CIM Standing Committee on Reserve Definitions and adopted by the CIM Council December 11, 2005.
4. S.G. of 2.85 tonnes/m3 (or 3.14 tons/m3) was used.
6. Indicated amounts may not precisely sum due to rounding.

As is clear from the foregoing estimate, the total rare metal content of the Teasdale Zone is approximately 6 times the uranium content if the resource is predominantly constrained by geology and is not constrained in respect to a uranium cut-off grade. While this approach results in the inclusion of lower grading uranium mineralization, it does incorporate large volumes of economically interesting REE mineralization.

The commercial viability of REE mineralization was previously demonstrated by the historical recovery of yttrium as a by-product of uranium production at the Elliot Lake mines. These operations proved that separate facilities were not required to leach the REEs, and that once in solution, yttrium could be easily recovered. However the mine operators ignored the other REEs because the market was adequately served by deposits elsewhere. At present, Appia plans to produce a high-value REE-uranium concentrate through beneficiation of the ore. Appia future production plans will be determined by market conditions at that time, but will likely focus on either extracting the metals from solution as uranium oxide and as combined REE-oxides known as mischmetal, or producing a U-REE concentrate for sale. Appia's assay data indicates that the value of the REEs present will largely vest in cerium, lanthanum, neodymium and yttrium which account for 86.3% of the total REEs present.

Given the economic value of this resource, all future drilling will be directed at determining both the uranium and REE contents of the zone. Given that the tonnage of the REE-U resource is much smaller than the tonnage of the uranium resource, and given the close association between U and REE's as discussed elsewhere in this report, it is most probable that the tonnage of the ultimate REE-U resource will be many times greater that that reported above once sufficient assay data is acquired to allow the zone to be fully defined in respect to its REE content.

The successful conclusion of Appia's most recent exploration programs at Teasdale and Banana Lake confirmed the uranium intersections previously reported in the historical diamond drill hole intersections, and the potential for significant REE production. In most cases, the new uranium intersections were comparable to the original intersections, although many were higher grading. Appia's new drilling also provided the opportunity to analyse the drill core for REEs and thereby estimate the size and potential of such resources present in that part of the Teasdale Zone drilled by Appia. To WGM's knowledge, this have never been investigated in the past. This small part of the Teasdale Zone contains a significant REE and uranium resource. Further discussion in the resources section of this report shows that the entire Teasdale Zone, as outlined historically, has the potential to contain approximately 400 million pounds of rare metals in addition to approximately 70 million pounds of uranium making it substantially larger than Pele's Eco Ridge deposit. Appia intends to continue its testing of the historical resource area to enlarge these NI 43-101 compliant resources, especially to the northwest of current drill sites.

The uranium Spot Price on 6 June, 2007 was US$135 per lb of U_3O_8 versus $45 at the time the original WGM report was written (Nov., 2009), a price retreat of approximately 65%. The Term Price at the time was $95 versus $65 at the later date, a retreat of approximately 35%. However it important to note that the Spot Price is the discount price and not the price at which most uranium is sold to energy utilities. As of the date of this report, the Spot and term prices are respectively, $60 and $70 per pound of U_3O_8. Several large orders have put upwards pressure on prices despite the ill-fated effects of the tsunami that ravaged nuclear stations on the Japanese coast. Utilities are intermittently buying in the spot market to supplement nuclear fuel supplies stockpiled at reactors and to satisfy the need for initial cores at new reactor sites. Despite this, substantial new capacity development is going ahead at various nuclear sites and continuing upwards pressure on prices seems certain which many new uranium mining projects are slowed due to social, political and capital risks. The permitting process for new uranium mining projects in greenfield areas is notorious for its delays, so sharp increases in production are unlikely. If the dynamics of the last uranium boom can be used as a model, lagging production will cause uranium prices to stabilize at a higher price than has been seen to date for a period of no less than 2-3 years. This may in fact be what is happening at this time.

During the 1980s, China emerged as a major producer of REEs at a time when Australian and American market shares decreased dramatically. Since 1998, more than 80% of the world's rare earth element (REE metal) production has come from China. China's dominance of world production has risen to 95% as higher cost producers were forced to curtail operations. Most of China's REE production is from the Bayan Obo deposit in Inner Mongolia.

Unlike uranium, REEs have a wide range of use in specialty alloys where they are indispensable. Lanthanum is used as a catalyst in the cracking of hydrocarbons to produce fuel. It is also used in fuel calls and batteries, in optical glass to modify the refractive index, in NiMH batteries for computers, in phosphors for X-Ray films and in reducing radiation dosages in MRI, CAT and sonogram imaging techniques. Cerium is used in catalytic converters and as an additive for diesel fuels. It is used in polishing compound for high performance glasses (television screens, mirrors, optical glass, disk drives and silicon microprocessors), and as a decolouring agent for glass and photographic filters. Cerium is an ingredient in high-strength, low alloy steels, and is used to improve performance in chrome plating baths. It is mixed with terbium in phosphors in tri-colour lamps and compact fluorescent lighting, and is used with zirconium in high-performance insulating ceramics (e.g. Space Shuttle). Neodymium is used in magnets for mobile phones, portable CD players and computers, and in high performance capacitors. Nd-lasers are used for surgery and in the manufacturing sector. Neodymium is used to produce strong permanent magnets for MRI units, although the strongest magnets are produced using an alloy of samarium and cobalt.

The current excitement that has gripped rare earth metal explorers is a relatively recent phenomena as governments have suddenly realized the strategic importance of REEs to key industrial applications. The Australian Government's review of national mineral activities for 2009 does not mention a single rare earth project even though several major discoveries were moving towards production. The search for REE deposits has been energized by ever-increasing demand for these metals in a wide range of 'high-tech' applications as well as the China's decision to begin restricting its exports of these metals in order to meet its own domestic needs. A summary of global production over the transition period from 1983 through 2003 is shown in the following summary. Most of the recent growth in the industry, to the 120,000 tonnes produced at this time, has resulted from increased output from China.

Table 1
Rare Earth Metal Oxide Production (Metric Tonnes) by Year

Country	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001	2003*
Australia	8,328	10,304	7,047	7,150	3,850	1,650	110	0	0	0	0
Brazil	2,891	2,174	2,383	1,377	719	270	103	0	0	0	0
China	n.a.	8,500	15,100	25,220	16,150	22,100	48,000	53,000	70,000	80,600	90,000
India	2,200	2,200	2,200	2,365	2,200	2,500	2,750	2,750	2,700	2,700	2,700
Kyrgyzstan	n.a.	n.a.	n.a.	696	721	0	n.a.	n.a.	6,115	3,800	n.a.
Malaysia	601	3,869	1,618	1,700	1,093	224	452	422	631	281	450
Mozambique	2	2	0	0	0	0	0	0	0	0	0
South Africa	0	0	660	660	237	237	0	0	0	0	0
Sri Lanka	165	110	110	110	110	110	110	110	120	0	0
Thailand	164	459	270	368	229	127	0	7	0	0	0
Russia	n.a.	n.a.	n.a.	7,626	6,138	4,468	2,000	2,000	2,000	2,000	2,000
United States	17,083	13,428	11,100	20,787	16,465	17,754	22,200	10,000	5,000	5,000	0
Zaire	6	0	53	96	66	11	5	0	0	0	0
Total	31,439	41,047	40,541	68,155	47,978	49,449	75,730	68,288	86,566	94,381	95,150

The mines of Elliot Lake are the only deposits in Canada which have seen rare metal production. During the 1970s and 1980s, yttrium was a major by-product of uranium mining at both the Denison and the Rio Algom operations. The Canadian Minerals yearbook documents production Although significant concentrations of rare earth metals were recognized, exceeding even that of yttrium, global prices for such metals at the time did not favour a commercial operation. This report represents an up-date of the previous WGM work to take into account the considerable unrealized value of rare earth metal mineralization present in the Elliot Lake deposits. To the best of WGM's knowledge, no previous resource estimates have ever been made for these metals which have become vital to many current technologies. According to the Canadian Minerals Yearbook for 1980, the yttrium concentrates from the Denison Mine averaged 60% total rare earths of which the relative rare metal contents were 0.8% La_2O_3, 3.7% CeO_2, 1.0% Pr_6O_{11}, 4.1% Nd_2O_3, 4.5% Sm_2O_3, 0.2% Eu_2O_3, 8.5% Gd_2O_3, 1.2% Tb_4O_7, 11.2% Dy_2O_3, 2.6% Ho_2O_3, 5.5% Er_2O_3, 0.9% Tm_2O_3, 4.0% Yb_2O_3, 0.4% Lu_2O_3, and 51.4% Y_2O_3.

Following the leaching of uranium ores and the stripping of uranium from the pregnant solution, leachate containing approximately 75% of the Y and 20% of the other REEs plus some thorium was neutralized with lime and injected air in Pachuka tanks to a pH of about 8.5. Following this, the oxidized slurry was thickened and the sediment bearing Y-rich underflow was recovered for further treatment. Yttrium rare earths were re-dissolved using sulphuric acid to generate a solution with a pH of about 4.2 from which other metal solids (Fe, Th, Al) were filtered off from the second stage solution. The rare earths were then precipitated a second time using ammonia gas, thickened and dried (Gupta & Krishnamurthy, 2005).

Recently, the greater Elliot Lake area has been receiving greater attention for its potential to produce rare earth metals. In November 2009, Montoro Resources Inc. confirmed that it had intersected significant concentrations of rare earth oxides on its Serpent River property located 13 km east of Elliot Lake. The company's drilling program had intersected elevated REE mineralization associated with uranium in the favoured quartz pebble conglomerates of the host Matinenda Formation. Six of the 12 holes drilled, spanning an area of about 300 m by 550 m, returned yttrium and rare earth values as high as 222 ppm Y, 1,290 ppm La, 2,350 ppm Ce, 249 ppm Pr, 579 ppm Nd and 139 ppm Sm as well as lower levels of Gd (87.7 ppm), Dy (50.9 ppm), Tb (11.1 ppm), Ho (8.4 ppm) and Eu (7.9 ppm).

WGM believes that the key to the success of the Appia project lies in the pricing fundamentals of the uranium and REE markets beyond that period of time required to adequately outline all of the resources present on the Appia Property, complete a feasibility study, permit and develop the project. While unknown, development is certain to occur in a timeframe when WGM believes that uranium and REE prices will almost certainly be higher than today due to growing demand.

WGM believes the Appia project offers the following positive factors:

1) the project is located in an established mining area close to existing electrical and water supplies as well as uranium infrastructure (the Cameco uranium refinery situated west of Elliot Lake near the town of Blind River);
2) associated REE production is another potential revenue generator that could exceed the value of uranium production;
3) the mineralization is stratabound with excellent lateral grade and thickness continuity;
4) the uranium and REE mineralization are interrelated and can be mined without changes to the mining plan;
5) mine rock conditions were favourable for underground development and their engineering properties are well understood;
6) historical evidence proves that REE recovery can utilize much of the same processing technology as that used for uranium production;
7) the area was subject to a long history of uranium and REE production, and the previous impacts have been successfully mitigated without serious adverse consequences for the local environment;
8) Appia bears no responsibility for potential environmental legacy issues in the future arising out of previous mining activities;
9) the metallurgy of Elliot Lake uranium and REE mineralization is well known in respect to milling characteristics as well as its leaching characteristics, including the application of bacteria leach technology to uranium;
10) other companies delineating new uranium and REE resources in the area, such as Pele Mountain Resources, as well as companies such as Denison Mines and Rio Algom which continue to hold significant Mineral Resources, may present opportunities for joint mill ownership or toll milling;
11) proximity to the Panel Mine which offers the potential for shaft revitalization and underground openings for mine infrastructure as well as in-stope leaching and waste disposal;
12) the project is located in Ontario, Canada, in an area that has a long mining tradition and in an investor-friendly jurisdiction that supports flow-through financing;
13) a hard-working and knowledgeable local labour force lives in northern Ontario;
14) excellent year-round project access and close to infrastructure and supply centres;
15) the property is large, extending over an area adjacent to and down-dip of former mine workings; and,
16) the potential to develop a large scale thorium resource from Elliot Lake tailings is a potential future consideration since India and some other countries are now working on the engineering challenges of using thorium fuel.

Some uncertainties concerning the overall potential for the resources remain. In respect to the Elliot Lake area, the intangibles that exist which may impact the project include:

1) potential for opposition by environmental activists; and,
2) some of the mineralization (e.g. Banana Lake Zone) is deep and capital intensive for development.

Based on Appia's results to date, additional exploration is clearly warranted.

WGM has identified a staged exploration program that, over time, minimizes risk by building slowly from the established facts concerning the historical work. For planning purposes, three phases of drilling are proposed on each zone for budgetary and cash flow reasons. WGM proposes a budget of C $14,600,000 for a multi-year exploration drilling project. Additional costs totalling $670,000 are provided for data acquisition, public forums, supporting surveys and studies. We believe that this exploration is justified based on the positive results of Appia's initial exploration programs. The drilling is divided between 15,405 m on the Teasdale Lake Zone and 17,600 m on the Banana Lake Zone. In carrying out this work, drilling on the Teasdale Lake Zone offers Appia the greatest potential for adding value to the project in the form of NI 43-101 compliant uranium and rare metal Mineral Resources.

The foregoing exploration programs must be executed in a flexible manner that is responsive to actual results. In the Banana Lake area, drill hole locations do not significantly influence hole depth, but it is certain that location may influence overall results in respect to uranium and REE contents. Careful attention to the geology of the mineralized zones (reefs) is required.

WGM recommends that Appia undertake a NI 43-101 compliant Preliminary Assessment ("**PA**") of the Teasdale Zone on conclusion of the recommended Teasdale drilling. Based on the results of Pele's PA on its Eco Ridge deposit, WGM believes that the Teasdale PA will provide ample justification for continuing investment in the Elliot Lake uranium and rare metal-bearing zones.

2. INTRODUCTION

2.1 GENERAL

In a letter dated 1 February, 2007 Canada Enerco Corporation ("**CEC**"), of Toronto, Ontario, Canada retained Watts, Griffis and McOuat Limited ("**WGM**") to undertake an evaluation of a group of uranium properties located in Buckles, Bouck, Beange, Gunterman and Joubin Townships, near the town of Elliot Lake in north-central Ontario. The aforementioned townships enclose portions of the famous **Elliot Lake Mining Camp** which produced uranium during the period 1955 through 1996. In a subsequent agreement dated 1 November, 2007, Appia Energy Corp. ("**Appia**") optioned the Property from CEC, and then requested that WGM up-date its previous report to encompass the results of recent diamond drilling carried out by Appia on the Property. The WGM-Appia agreement is dated 1 October, 2009. Further to this, this report has been up-dated in June, 2011 to incorporate the results of on-going sampling and metallurgical testing programs.

In the Elliot Lake camp, a total of 156,750 tons of uranium metal (313.5 million pounds) was produced from 13 underground mines from approximately 177 million tons of ore having an average grade of approximately 0.106% U_3O_8 (898 ppm U). This production equals approximately 362 million pounds of U_3O_8.[2] The primary mining method used was room and pillar mining with significant resource losses in pillar support (50-70% ore extraction). The ore was hoisted and transported to a central mill for crushing, grinding and leaching using sulphuric acid to dissolve the uranium. Uranium was then stripped from the solution using sulphuric acid (solvent) extraction and ion exchange processes to produce a uranium-oxide precipitate (yellowcake) which was then dried and shipped for further refining. Yttrium, rare earth metals, thorium and some other metals (Fe, Al…) were also present in the pregnant solution from which the yttrium and rare earth metals were recovered separately.

In addition to the primary mining production, a number of alternative techniques were pioneered both at Elliot Lake as well as at Kerr Addison's Agnew Lake Mine, 70 km to the east, to enhance uranium recovery. Principal amongst the secondary techniques was the use of bio-leaching and ion exchange columns to recover small amounts of uranium from mine waters being pumped to surface. Denison Mines Limited established an underground bacterial leaching program in the mid-1960s, and initiated a research program in 1980 to expand bio-leach production. In addition, underground leaching was carried out on broken

[2] 1 million lbs of U_3O_8 are equivalent to approximately 385 metric tonnes of uranium metal.

ore packed into the open stopes following the primary mining of ore. The stopes were sealed and then flooded for leaching. Oxygen was introduced into the stope to accelerate the leaching. Spray leaching was also used to extract the uranium from underground pillars and a portion of the broken ore, and to some degree the wet-dry-wet cycling of the spraying program resulted in higher recoveries. At the Agnew Lake Mine, the steeply dipping geometry of the ore zones allowed Kerr Addison to 'long-hole' stopes which were similarly sealed and flooded with leachate. This proved to recover only half of the estimated uranium present in the ore. Kerr Addison also attempted heap-leaching of ore on surface, but this again failed to produce anticipated recoveries.

During the 20-year period ending in the 1980s, the accumulation of significant uranium stockpiles far exceeding market demands led to a prolonged slump in uranium prices beginning in 1981. Relative to the open-pitable high-grade ores in the Athabasca Basin of Saskatchewan, the lower grading ores of Elliot Lake fell out of favour and one by one the mines closed. Most of the mines contained significant, readily leachable uranium resources at the time that uranium prices declined, but the deep underground workings resulted in operating costs that made the resources uneconomic. That factor combined with lower demand for new uranium production resulted in the closing of the Elliot Lake camp, and the decommissioning of the mines.

The purpose of WGM's initial review was to document the historical uranium resource estimates pertaining to the Appia claims. A subsequent report dated 11 September, 2008, quoted herein, entailed the estimation of the uranium resources in the Teasdale Lake and Banana Lake zones in accordance with Canada's securities regulators' rule National Instrument 43-101 ("**NI 43-101**").

Senior WGM Geologist and Vice-President, Al Workman, P.Geo., visited key Ontario ministry offices in Sault Ste. Marie and visited the Elliot Lake area on 15-16 May, 2007. Mr. Workman is a Qualified Person ("**QP**") as defined under National Instrument 43-101 having spent nearly six (6) years engaged exclusively in uranium exploration during the period 1975-1982, and having visited the Elliot Lake mining district many times prior to, during and following that period. Mr. Workman was most recently accompanied by Mr. Robert McGregor, an independent mining engineer and resident of Sault Ste. Marie. Mr. McGregor is very familiar with the area having worked at the Stanrock Mine during which time the Kerr McGee drill holes were completed. The purpose of the visit was to re-familiarize WGM with the project area, as well as to discuss uranium mining with representatives of the Ministry of Northern Development and Mines ("**MNDM**") as well as the Ministry of the Environment ("**MOE**"). Mr. Workman and Mr. McGregor tried to locate the drill sites of two deep drill holes previously completed by Kerr McGee Corporation and were successful in both attempts. The fact that Kerr McGee left its casing in the ground and capped has been well established.

Since no exploration work was being carried out in the property area by Appia at the time of the initial visit, Mr. Workman concentrated on issues likely to impact a ground-based exploration program. The geology of the Elliot Lake mining camp is very well known and, arguably, one of the best documented camps in Canada. As no former mines were accessible, and the taking of surface samples for analysis would produce meaningless results, no attempts were made to take such samples. WGM obtained a complete set of drill hole logs for the subject area. Little of this drill core is available for examination as many companies at the time used the whole core for analysis leaving no archived material. A minor amount is available for examination at the MNDM core library in Sault Ste. Marie. For obvious reasons, this historical core is not available for taking check samples.

The initial report completed by WGM was dated 31 May, 2007 and was written at a time when international uranium markets were quite active and prices were relatively high in comparison to those that prevail today. While the overall tone of this report may be more conservative, WGM continues in its belief that uranium shortages will drive the market price substantially higher over the next decade.

Between 18 November, 2007 and 12 March, 2008 Appia completed a Stage 1 exploration program comprising a total of 10 diamond drill holes using 2 drilling rigs (6 new holes and 4 wedged holes totalling 3,885.2 m). Exploration expenditures totalled approximately C$ 2,000,000. The drilling confirmed previously reported intersections and provided the basis for WGM to complete a NI 43-101 compliant resource estimate on the Banana Lake and Teasdale Lake zones. WGM revisited the project site during 3-4 June, 2009 accompanied Appia's independent consulting geologist, Mr. Alan MacEachern, formerly Chief Mine Geologist for Denison Mines Ltd. Discussions with Mr. MacEachern and follow-up correspondence resulted in WGM gaining valuable insights into the local geology that are not available in published literature. During this site visit WGM confirmed that the reported exploration work had been completed, and re-examined key intervals of mineralized drill core.

From October to December 2008, Appia carried out a second program of diamond drilling on the Banana Lake Zone. This exploration entailed new step-out drilling within the resource area of the zone previously identified by Rio Algom based on widely separated Kerr McGee drill holes. Using the new data, WGM up-dated the previous NI 43-101 compliant resource estimate, the results of which showed a substantial increase in tonnage over WGM's initial estimate, as well as a 20% increase in grade over historical estimates.

Following its review of the most recent data, WGM provided Appia with an up-dated report dated 19 November, 2009. The content of the earlier report has been largely retained, and new diamond drill data was discussed therein.

Due to the significant hiatus between the closure of the mines and the present, no drill core was available for check sampling. As part of this assignment, WGM reviewed core logs and various technical reports that were prepared by previous mine operators. WGM believes that the information in these files is an accurate representation of the state of knowledge at the time the mines closed. Furthermore, in every instance, Appia's drilling programs have confirmed the previous uranium intersections which lends considerable veracity to the historical resource estimates.

WGM has included the use of several historical resource estimates in this report. The estimates are based on widely spaced drilled holes completed by several of the major companies operating in the Elliot Lake area during the 1970s and 1980s. The resources are deep, and are located down-dip of previous mine workings. The use of widely spaced holes was common practice in the Blind River district due to the uniformity of the stratabound mineralization. The historical resources, which were estimated by companies well acquainted with both the area and with uranium mining, are inferred, and their inclusion herein is used because WGM believes that the these resources are material to the exploration potential and future economic value of the Appia mineral claims. Given these facts however, WGM cautions that the historical resource estimates contained herein do not meet current standards as defined by the Canadian Institute of Mining and Metallurgy ("**CIM**") and implemented under Canadian Securities Regulators' Rule National Instrument 43-101 ("**NI 43-101**").

In this report, WGM has included a preliminary assessment of the historical uranium resources as we believe that the results of this assessment shed considerable light on the potential exploitation of uranium resources hosted in quartz-pebble conglomerates deeper in the basin. WGM has attempted to conceptually examine the conditions that might allow the remaining deep resources present at Elliot Lake to be brought into production. In this respect, the assessment is a material fact that is relevant to Appia's longer term plans. The continuity of the historical resources on which WGM's assessment is made is somewhat speculative although sufficient drilling has now been completed by Appia to confirm many of the earlier intersections and to give credence to the concept that considerable uranium resources exist on the Appia property. In any sense, there was insufficient economic certainty in the parameters used to classify the mineralization as reserves. There is no certainty that the outcomes of the preliminary assessment will be realized. Nevertheless, significant inputs have been made by WGM mining engineers and processing engineers (QPs) that we are satisfied that the assumptions contained herein are reasonable.

WGM's conceptual model of a portion of the uranium resources believed to underlie Appia's Elliot Lake property is intended to provide Appia with an assessment of the conditions that could allow the uranium resources to be mined, and explore various options for mining. On-going discussions with Mr. MacEachern have been extremely valuable in determining the parameters used in modelling the rare earth mineralization. The initial drilling, as well as the drilling program that followed, confirmed the earlier intersections and contributed to increasing the size of the area drill-tested with sufficient confidence to permit WGM to define an Inferred Mineral Resource that is NI 43-101 compliant. Additional exploration drilling is recommended to further enlarge the zone of mineral resources.

2.2 TERMS OF REFERENCE

During early 2007, **Canada Enerco Corporation** ("**CEC**"), of Toronto, Ontario, Canada retained **Watts, Griffis and McOuat Limited** ("**WGM**") to undertake a review of a group of its uranium properties (the "**Property**") located in Buckles, Bouck, Beange, Gunterman and Joubin Townships, north-central Ontario. CEC is an Ontario-registered private corporation based in Toronto, Canada. Also based in Toronto, WGM is a consulting firm of geologists and engineers which has been providing high quality technical services to the mineral industry since 1962.

As a result of a vending agreement dated 1 November, 2007 between CEC and Appia Energy Corp. ("**Appia**") of Toronto, a related company, WGM was retained by Appia to prepare an up-date of its previous work including initial Mineral Resources estimates for the Banana Lake and Teasdale Lake zones carried out during the fourth quarter of 2008 and early 2009.

The Appia Property comprises a group of staked mining claims which cover the extensions of uranium ore zones from past-producing mines located on the north and south limbs of the Quirke Lake Syncline. As room and pillar mining was the favoured mining method, the mines contain substantial uranium resources left in pillars and undeveloped mineralized zones. The extensions of these zones are inferred to contain a considerable uranium resource based on previous drilling. The reviews undertaken by WGM included a conceptual study to examine means by which the remaining historical uranium resources might be exploited, either via the existing mine infrastructure or alternatively by developing a new mine(s). Included in that study was a discussion of adapting in-situ leaching for uranium recovery. The report based on WGM's findings was dated 31 May, 2007. The findings of the WGM reviews and estimates were up-dated in November, 2009 and again in June, 2011 as the basis for this report.

This up-date includes the previous finding, the results of the most recent drilling program, WGM's earlier resource estimates and up-dated estimates using newly acquired analytical data for rare earth element (REE) mineralization in Appia drill core. The discussion of the uranium market has been modified to include the conclusions expressed by the World Nuclear Association in its biennial meeting in London, UK, held on 9-11 September 2009. Despite the recent Fukushima nuclear accident, an incident borne not out of a technological failure but out of a natural disaster, most countries have not abandoned plans to expand their nuclear-electric generating capacities.

The purpose of WGM's initial technical review was to document the historical uranium resource estimates pertaining to the Appia claims:

1) to conceptually review the economic potential of the historical uranium resources estimated by Kerr McGee located in the central area of the property geology of the property area;
2) to review the local geology of the Elliot Lake area and to re-examine the current geological models;
3) to determine whether previous drill holes could be relocated in the field as a potential means of retesting the uranium-bearing zone at depth without substantially redrilling the thick overlying sequence;
4) to determine whether impediments exist to renewed uranium mining in the Elliot Lake area; and,
5) to prepare a final report detailing the results of the WGM review.

A subsequent report by WGM dated 11 September, 2008 contained NI 43-101 compliant Mineral Resources estimates for the uranium contained in the Teasdale Lake Zone and in the

Banana Lake Zone. This report was prepared by WGM to provide an up-date to the previous report. It includes the results of a second drilling program completed in December, 2008 on the Banana Lake Zone. WGM has written this report to comply with the requirements of NI 43-101. WGM did not review legal, environmental, political, surface rights, water rights or other non-technical issues which might indirectly relate to its reports as Appia will retain legal counsel for these purposes.

WGM understands that it is Appia's intent to use WGM's report(s) as supporting documents to support a future "going public" transaction.

APE REP / APE_01_Loc_Map.cdr
Last revision date: Thursday 12 November 2009

Watts, Griffis and McOuat

Figure 1.

APPIA ENERGY CORP.

Elliot Lake Property

Ontario, Canada

Project Location Map

2.3 SOURCES OF INFORMATION

The historical exploration information reviewed during this assignment, and incorporated into this NI 43-101 compliant report, was largely collected from the public records of the Ministry of Northern Development and Mines ("**MNDM**") offices located in Sault Ste. Marie, Ontario. WGM also relied upon its own library and research resources as well as the expertise of its personnel. WGM spot tested the information given for reliability against MNDM files. Other information was gleaned from authoritative internet sources such as the World Nuclear Association, the Canadian Nuclear Safety Commission, the Canadian Nuclear Association, the International Atomic Energy Association, and the World Information Service on Energy ("**WISE**") Uranium Project.

The site visits by WGM Senior Geologist Al Workman were used as opportunities to collect additional public information from the records of the MNDM regional office in Sault Ste. Marie, to discuss exploration policy with ministry representatives and to meet with Ministry of the Environment officials.

WGM reviewed various licence documents (abstracts), but did not carry out a detailed audit of the certificates in order to verify title to any of the properties described herein. Efforts were made through discussions with MNDM personnel to understand the nature of any potential challenges which might arise in respect to resuming uranium production in the Elliot Lake area. Similar discussions were held with Ministry of the Environment (MOE) representatives. Importantly, WGM ascertained that the Ontario Government would fully uphold the rights of any mineral claim owner to undertake such development in compliance with existing laws and regulations.

Given the long period of time that has elapsed since the Elliot Lake area was actively being explored and mined, substantial sections of drill core from the key holes put down by Kerr McGee and other companies were not available for examination. Although a few representative sections of mineralized drill core have been maintained in the MNDM core library in Sault Ste. Marie, Ontario, such material is of limited quantity and great historical significance, and is therefore not available for resampling. No surface exposures were sampled as the results of such samples would have been irrelevant given the scope of the undertaking under consideration by Appia.

This report is the responsibility of WGM which alone has been in charge of its overall presentation.

2.4 RELIANCE ON OTHER EXPERTS

During its visit to Sault Ste. Marie, WGM met with Mr. Robert MacGregor, P.Eng., a mining engineer resident in the city, and a former employee at the Denison Mine. Mr. MacGregor's recollections as to the location of exploration drill holes was also instrumental in reducing the time spent by WGM searching for historical drill holes.

Following the completion of the initial drilling program during early 2008, Appia retained the services of Mr. Alan MacEachern, a consulting geologist and Elliot lake resident who has 40 years of experience in the mining camp. Mr. MacEachern was involved in the management of drilling programs and the logging of drill core during his tenure with Dennison Mines Ltd. and thereby contributes an intimate knowledge of the many uranium-bearing horizons ("reefs") in the Matinenda Formation. WGM subsequently met with Mr. MacEachern with who it has an on-going dialogue concerning the application of geology to uranium and REE resource estimations. Significant personal insight and additional information was supplied by WGM Associate Process Engineer, Mr. Richard Swider, P.Eng., a former metallurgical engineer at the Denison Mine.

WGM relied on the MNDM offices to provide accurate land title information and did not ascertain or confirm the legal status of the Appia mining claims beyond downloading from the MNDM a list of current claim owners in the project area.

One key goal of the earlier WGM site visit was to locate the position of some of the Kerr McGee drill holes. Although the locations provided to WGM by the MNDM from the ministry database proved to be inaccurate, WGM was able to reliably re-locate holes using the sketch maps contained within individual drill hole records filed for assessment. To this extent, WGM's reliance on the Ministry records was conditional, and done solely as a means of establishing the search area within which the hole was likely to be found [3].

3 Subsequent to WGM's efforts, Appia reported that it was able to locate all of the historical holes that it searched for.

2.5 UNITS AND CURRENCY

All monetary sums relating to uranium prices are reported in United States dollars (US$) unless stated otherwise. A conversion rate of 0.85 Canadian dollars (C$) to the United States dollar (US $) was used in respect to developing historical cost models. The qualification of current resource estimates has been made on the basis of 0.90 C$ to the US$.

Measurements in this report are stated in the SI (metric) system. In keeping with norms in the industry, uranium grades are reported as pounds triuranium octoxide (commonly referred to as "yellowcake" or U_3O_8) per short ton. Less commonly, uranium content is reported as per cent uranium oxide (%U_3O_8).[4] Assay data may be reported as parts per million (ppm).

Uranium supply pricing is predominantly established during direct contract negotiations between producers and energy utilities, and the quantities involved are typically several million pounds or more of U_3O_8. This is commonly referred to as the Term Market. Smaller quantities of uranium, measured in hundreds of thousands of pounds of U_3O_8, may be offered for sale on one of several Spot Markets. The prices on the Spot Market bid by utilities seeking to increase on-site fuel supplies is generally discounted with respect to the prices established under Term contracts, however in times of uncertainty regarding future pricing, the Spot Market price can exceed the Term price resulting in an inverted market. Prices on both markets are quoted in US $ per pound of U_3O_8.

The classification of Mineral Resources and Mineral Reserves in Canada follows the codification established by the CIM. The CIM system, which must be followed in order to assure NI 43-101 compliance, ranks Mineral Resources and Mineral Reserves in terms of confidence level which in turn is a reflection of the types and amounts of exploration work completed. The conversion of resources to reserves is based on a study of mineral economics that establishes the economic viability of the existing resources under a specific set of conditions. The Mineral Resources estimated by WGM based on recent Appia drilling programs are in compliance with NI 43-101.

The historical resources mentioned herein this report cannot be precisely confirmed by the authors and are not suitable for investment decisions.

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[4] Units conversions :
1% U metal = 1.18% U_3O_8
2 lb U_3O_8/ton = 1 kg U_3O_8/tonne

2.6 RISK FACTORS

As is generally the case in the world at large, natural resources including mineral commodities are the property of the sovereign State, and the right to develop and exploit mineral deposits is conveyed to private interests via permitting and licensing procedures and agreements. Mineral projects must therefore meet certain conditions and pass certain statutory requirements to be permitted to go into production. Due to a combination of legitimate concerns and irrational fears, uranium projects receive special attention which can prolong the permitting process. This is especially true for mining projects that are located close to settlements as is the case with some of the Appia mining claims, although the main Mineral Resource areas are located at some distance from the town of Elliot Lake. However, WGM understands from its conversations with Mr. Bob McGregor that Elliot Lake municipal leaders are generally in favour of renewed exploration and mining activity as a means of increasing tax revenue to the city. Mr. McGregor had previously met with two town officials in his capacity as an independent consultant. This sentiment has been confirmed recently in discussions with the aforementioned Mr. MacEachern, a long-standing resident of Elliot Lake.

Subject to the foregoing caution, however, which is not in any way a fatal flaw to the project, there are no land use restrictions of which WGM is aware which might restrict the ability of Appia to access the project areas, or which might restrict its ability to bring its uranium property into production.

Balancing the forgoing caution are several factors which are favourable for the Appia project:

- new mine infrastructure development would be in brownfields areas;
- water, electrical, transportation and communications infrastructure is in place or close at hand;
- the processing of ore in this area is well known and faces no significant technical uncertainties;
- Appia bears no responsibility (liability) in any manner for potential future impacts arising out of historical mining operations and waste disposal; and,
- the Cameco uranium refinery is located approximately 50 km away near Blind River.

As far as WGM knows, all of the claims that are the subject of this report are presently held by Appia without legal encumbrances by the Government which would relate to previous mining activities. The reader is also directed to the section in this report entitled "Other Relevant Data and Information", specifically the sub-section on environmental policy and issues.

3. PROPERTY DESCRIPTION AND LOCATION

3.1 GENERAL LOCATION

The Appia uranium-REE property comprises a group of 84 mineral claim units located in Buckles, Bouck, Beange, Gunterman, Joubin and Lehman Townships and near the town of Elliot Lake in north-central Ontario (Figure 2). Elliot Lake is located on Highway 108 approximately 26 km north of Highway 17, also known as the Trans-Canada Highway. The area is situated in UTM zone 17. The geographic co-ordinates of the town of Elliot Lake are 46^{o}23'N latitude and 82^{o}39'W longitude.

3.2 PROPERTY LOCATION

The Appia claims are located in Buckles, Bouck, Beange, Gunterman and Joubin Townships in north-central Ontario (Figure 1). The claims are unpatented and have not been surveyed. As is typical for exploration properties, Appia does not own the surface rights to the underlying mineral claims. The surface rights to the claims belong to the Crown and some belong to the City of Elliot Lake. Surface rights can be acquired and there is sufficient area to construct the infrastructure necessary for mining and processing operations.

3.3 PROPERTY ADMINISTRATION AND STATUS

Mineral claim titles in the Province of Ontario are administered by the Ministry of Northern Development and Mines ("**MNDM**"). The Elliot Lake area is administered by the regional office located in the city of Sault Ste. Marie, a major government centre in north-central Ontario. Other government offices in the city include those charged with administering regulations pertaining to the environment, inland waterways, transportation and communications. The Appia Property consists of 100 staked mining claim units with anniversary dates ranging from 19 October, 2004 to 11 December, 2009 (Table 2). Originally, 58 of the claims were held by CEC, however 100% ownership in these claims was transferred to Appia on 27 July, 2009. The terms of this agreement are discussed in Section 3.4 Nature of Appia's Interest. As can be seen from the following table, excess expenditures have been foiled against the claims ensuring that they remain in good standing.

Table 2
Location of Appia Claim Blocks

Township [1]	Claim Number	Recording Date	Due Date	Status	Ownership [2]	Work Required	Total Applied	Total Reserve
BEANGE	4201498	2005-May-02	2012-May-02	Active	100% *	$4,800	$24,400	$0
BEANGE	4201499	2005-May-02	2012-May-02	Active	100% *	$4,000	$20,000	$0
BEANGE	4201500	2005-May-02	2012-May-02	Active	100% *	$6,400	$32,000	$0
BEANGE	4201501	2005-May-02	2012-May-02	Active	100% *	$6,400	$32,000	$132,093
BEANGE	4201502	2005-May-02	2012-May-02	Active	100% *	$6,400	$32,000	$0
BEANGE	4201503	2005-May-02	2012-May-02	Active	100% *	$6,000	$30,000	$0
BEANGE	4201504	2005-May-02	2012-May-02	Active	100% *	$6,000	$30,000	$0
BEANGE	4205717	2005-Jun-28	2012-Jun-28	Active	100% *	$2,400	$12,000	$1,000
BEANGE	4207326	2005-May-02	2012-May-02	Active	100% *	$6,400	$32,000	$0
BEANGE	4219904	2007-Mar-27	2012-Mar-27	Active	100% *	$800	$2,400	$0
BEANGE	4219907	2007-Mar-27	2012-Mar-27	Active	100% *	$1,600	$4,800	$0
BEANGE	4219941	2007-Mar-27	2012-Mar-27	Active	100% *	$1,600	$4,800	$0
BEANGE	4219969	2007-Mar-27	2012-Mar-27	Active	100% *	$1,200	$3,600	$0
BEANGE	4219977	2007-Mar-27	2012-Mar-27	Active	100% *	$1,600	$4,800	$0
BEANGE	4243832	2008-Sep-12	2011-Sep-12	Active	100% *	$1,600	$1,600	$0
BEANGE	4248859	2009-Dec-11	2011-Dec-11	Active	100%	$1,600	$0	$0
BEANGE	4248860	2009-Dec-11	2011-Dec-11	Active	100%	$6,400	$0	$0
BOLGER	4219968	2007-Mar-27	2012-Mar-27	Active	100% *	$2,400	$7,200	$0
BOLGER	4248857	2009-Dec-11	2011-Dec-11	Active	100%	$1,600	$0	$0
BOLGER	4248858	2009-Dec-11	2011-Dec-11	Active	100%	$3,200	$0	$0
BOUCK	3019176	2006-Dec-21	2011-Dec-21	Active	100% *	$3,600	$10,800	$0
BOUCK	3019177	2006-Dec-21	2011-Dec-21	Active	100% *	$3,200	$9,600	$413,466
BOUCK	3019230	2006-Dec-21	2011-Dec-21	Active	100% *	$6,400	$19,200	$510
BOUCK	3019231	2006-Dec-21	2011-Dec-21	Active	100% *	$6,400	$19,200	$2,000
BOUCK	3019232	2006-Dec-21	2011-Dec-21	Active	100% *	$4,800	$14,400	$400
BOUCK	3019233	2006-Dec-21	2011-Dec-21	Active	100% *	$3,200	$9,600	$1,200
BOUCK	3019234	2006-Dec-21	2011-Dec-21	Active	100% *	$4,800	$14,400	$614,408
BOUCK	4205718	2005-Jun-28	2012-Jun-28	Active	100% *	$400	$2,000	$200
BOUCK	4207259	2006-Dec-21	2011-Dec-21	Active	100% *	$4,000	$12,000	$0
BOUCK	4207262	2006-Dec-21	2011-Dec-21	Active	100% *	$6,000	$18,000	$0
BOUCK	4215011	2007-Feb-27	2012-Feb-27	Active	100% *	$400	$1,200	$0
BOUCK	4215012	2007-Feb-27	2012-Feb-27	Active	100% *	$3,200	$9,600	$0
BOUCK	4215013	2007-Feb-27	2012-Feb-27	Active	100% *	$1,200	$3,600	$0
BOUCK	4215302	2006-Dec-29	2011-Dec-29	Active	100% *	$1,600	$4,800	$0
BOUCK	4218619	2007-Aug-01	2011-Aug-01	Active	100%	$4,000	$8,000	$0
BOUCK	4219908	2007-Mar-30	2012-Mar-30	Active	100% *	$400	$1,200	$0
BOUCK	4221243	2004-Oct-19	2011-Oct-19	Active	100% *	$5,200	$26,000	$0
BOUCK	4221244	2004-Oct-19	2011-Oct-19	Active	100% *	$2,800	$14,000	$0
BOUCK	4221245	2004-Oct-19	2011-Oct-19	Active	100% *	$6,400	$32,000	$0
BOUCK	4248854	2009-Dec-11	2011-Dec-11	Active	100%	$400	$0	$0
BOUCK	4248855	2009-Dec-11	2011-Dec-11	Active	100%	$400	$0	$0
BUCKLES	3009193	2004-Oct-19	2012-Oct-19	Active	100% *	$1,200	$7,200	$0
BUCKLES	4201526	2004-Nov-16	2011-Nov-16	Active	100% *	$800	$4,000	$0
BUCKLES	4202357	2004-Oct-19	2011-Oct-19	Active	100% *	$800	$4,000	$169,870
BUCKLES	4202381	2004-Oct-19	2011-Oct-19	Active	100% *	$6,400	$32,000	$211,815
BUCKLES	4205719	2005-Jun-28	2012-Jun-28	Active	100% *	$4,800	$24,000	$1,400
BUCKLES	4215303	2006-Dec-29	2011-Dec-29	Active	100% *	$5,200	$15,600	$0
BUCKLES	4215314	2006-Dec-21	2012-Dec-21	Active	100% *	$2,000	$8,000	$110
BUCKLES	4215315	2006-Dec-21	2015-Dec-21	Active	100% *	$400	$2,800	$749
BUCKLES	4216851	2007-Nov-13	2011-Nov-13	Active	100% *	$6,000	$12,000	$0
BUCKLES	4216852	2007-Nov-13	2011-Nov-13	Active	100% *	$6,400	$12,800	$0
BUCKLES	4216869	2007-Nov-13	2011-Nov-13	Active	100% *	$6,400	$12,800	$0

table continues.....

Table 2
Location of Appia Claim Blocks

Township [1]	Claim Number	Recording Date	Due Date	Status	Ownership [2]	Work Required	Total Applied	Total Reserve
BUCKLES	04216870*[3]	2007-Nov-13	2011-Nov-13	Active	100% *	$6,400	$12,800	$0
BUCKLES	4216871	2007-Nov-13	2011-Nov-13	Active	100% *	$4,800	$9,600	$0
BUCKLES	4216872	2007-Nov-13	2011-Nov-13	Active	100% *	$1,200	$2,400	$0
BUCKLES	4219974	2007-Apr-13	2012-Apr-13	Active	100% *	$400	$1,200	$0
BUCKLES	4219978	2004-Oct-19	2011-Oct-19	Active	100% *	$400	$2,000	$0
BUCKLES	4219979	2004-Oct-19	2011-Oct-19	Active	100% *	$400	$2,000	$0
BUCKLES	4219980	2004-Oct-19	2011-Oct-19	Active	100% *	$400	$2,000	$0
BUCKLES	4221246	2004-Oct-19	2011-Oct-19	Active	100% *	$6,000	$30,000	$0
BUCKLES	4221249	2004-Oct-19	2011-Oct-19	Active	100% *	$6,000	$30,000	$0
BUCKLES	4221250	2004-Oct-19	2011-Oct-19	Active	100% *	$6,400	$32,000	$349,863
BUCKLES	4221251	2004-Oct-19	2011-Oct-19	Active	100% *	$4,000	$20,000	$156,380
BUCKLES	4221252	2004-Oct-19	2011-Oct-19	Active	100%	$6,400	$32,000	$0
BUCKLES	4222197	2008-Feb-19	2012-Feb-11	Active	100%	$4,800	$0	$0
BUCKLES	4222202	2008-Feb-19	2012-Feb-11	Active	100%	$6,000	$0	$0
BUCKLES	4222203	2008-Feb-19	2012-Feb-11	Active	100%	$800	$0	$0
BUCKLES	4226849	2008-Aug-21	2011-Aug-21	Active	100%	$1,600	$1,600	$0
BUCKLES	4226852	2008-Aug-21	2011-Aug-21	Active	100%	$1,600	$1,600	$0
BUCKLES	4228612	2008-Jan-24	2012-Jan-24	Active	100%	$1,200	$2,400	$0
BUCKLES	4228970	2008-Feb-19	2012-Feb-19	Active	100% *	$1,600	$3,200	$0
BUCKLES	4228971	2008-Feb-19	2012-Feb-19	Active	100% *	$400	$800	$0
GUNTERMAN	3019178	2006-Dec-21	2011-Dec-21	Active	100%	$1,200	$3,600	$0
GUNTERMAN	3019179	2006-Dec-21	2011-Dec-21	Active	100%	$4,400	$13,200	$0
GUNTERMAN	3019180	2006-Dec-21	2011-Dec-21	Active	100%	$2,400	$7,200	$0
GUNTERMAN	4215008	2007-Feb-27	2012-Feb-27	Active	100%	$4,800	$14,400	$0
GUNTERMAN	4215009	2007-Feb-27	2012-Feb-27	Active	100%	$800	$2,400	$0
GUNTERMAN	4215010	2007-Feb-27	2012-Feb-27	Active	100%	$800	$2,400	$0
GUNTERMAN	4215014	2007-Feb-27	2012-Feb-27	Active	100%	$4,800	$14,400	$0
GUNTERMAN	4215015	2007-Feb-27	2012-Feb-27	Active	100%	$1,600	$4,800	$0
GUNTERMAN	4217961	2007-Feb-07	2012-Feb-07	Active	100%	$1,200	$0	$0
GUNTERMAN	4218458	2007-Feb-07	2012-Feb-07	Active	100%	$1,200	$0	$0
GUNTERMAN	4218459	2007-Feb-19	2012-Feb-07	Active	100%	$1,600	$0	$0
GUNTERMAN	4218461	2007-Feb-19	2012-Feb-07	Active	100%	$1,200	$0	$0
GUNTERMAN	4218620	2007-Aug-01	2011-Aug-01	Active	100%	$2,400	$4,800	$0
GUNTERMAN	4218621	2007-Aug-01	2011-Aug-01	Active	100%	$4,000	$8,000	$0
GUNTERMAN	4248851	2009-Dec-11	2011-Dec-11	Active	100%	$3,200	$0	$0
GUNTERMAN	4248852	2009-Dec-11	2011-Dec-11	Active	100%	$4,000	$0	$0
GUNTERMAN	4248853	2009-Dec-11	2011-Dec-11	Active	100%	$1,600	$0	$0
JOUBIN	3019312	2006-Dec-21	2011-Dec-21	Active	100%	$6,000	$18,000	$0
JOUBIN	3019313	2007-Feb-02	2012-Feb-02	Active	100%	$3,600	$10,800	$0
JOUBIN	4205720	2005-Jun-28	2012-Jun-28	Active	100%	$3,600	$18,000	$800
JOUBIN	4214928	2007-Feb-27	2012-Feb-27	Active	100%	$400	$1,200	$0
JOUBIN	4215016	2007-Feb-27	2012-Feb-27	Active	100%	$1,600	$4,800	$0
JOUBIN	4215309	2006-Dec-29	2011-Dec-29	Active	100%	$4,800	$14,000	$0
JOUBIN	4215313	2007-Feb-02	2012-Feb-02	Active	100%	$3,600	$10,800	$0
JOUBIN	4226850	2008-Aug-21	2011-Aug-21	Active	100%	$3,600	$3,600	$0
JOUBIN	4226862	2008-Aug-21	2011-Aug-21	Active	100%	$3,600	$3,600	$0
JOUBIN	4226863	2008-Aug-21	2011-Aug-21	Active	100%	$3,600	$3,600	$0
LEHMAN	4243828	2008-Sep-12	2011-Sep-12	Active	100%	$6,400	$6,400	$0
					Totals	$324,400	$994,000	$2,056,264

NOTES:
(1) The township is designated as per the location of the #1 claim post.
(2) Ownership marked by an asterisk (*) were subject to a transfer (option) agreement between Appia Energy and CEC.
(3) This claim number was issued by the MNDM twice and the Ministry determined that the Appia claim should receive a "0" prefix to reduce confusion rather than issue a replacement claim number.

Mineral claim titles in the Province of Ontario are administered by the Ministry of Northern Development and Mines ("**MNDM**"). The Elliot Lake area is administered by the regional office located in the city of Sault Ste. Marie, a major government centre in north-central Ontario. Other government offices in the city include those charged with administering regulations pertaining to the environment, inland waterways, transportation and communications.

The Appia claims are unpatented, staked claims which are subject to annual exploration expenditure requirements (Figure 3). These requirements, presented in Table 1, are assessed on a per-claim basis, and must be met in order to maintain the claims in good standing. The MNDM monitors the completion of assessment work through a reporting system that demands the claim holder file an annual assessment report by the anniversary date for each claim, or group of claims. Work credits may be spread over blocks of contiguous claims.

The anniversary date for the individual claim comprising the Appia Property are shown in Table 1. The total work commitment required to maintain the claims in good standing is C $324,400. At this time, Appia has filed excess expenditures and has actually expended C $2,056,264 which remains in reserve for meeting future requirements (Table 2). Appia has no relinquishment plans at this time, and does not see a need to relinquish any claims in the future.

Certain of the mining claims (#4214928, 4221249 and 4228612), while valid, are currently subject to a decommissioning licence issued under the Nuclear Safety and Control Act. The licence holder, Denison Mines Inc., is obligated to undertake a work program relating to control of environmental impacts and restoration of the land. Appia is required to avoid exploration activities that might interfere with the execution of such work programs. It is clear from correspondence received by Energy Metals Corp. (see following section) that Denison does not have the authority to grant access to these claims for the purpose of exploration drilling.

3.4 NATURE OF APPIA'S INTEREST

Appia holds its mineral titles as a result of having acquired the claims under the terms of an agreement dated 1 November, 2007 with CEC which originally staked the claims in accordance with the Mining Act of Ontario R.S.O. 1990. The claims are now held 100% by Appia. Under the Vending Agreement, Appia paid 35 million common shares to CEC in exchange for the claims and Appia was granted two options by CEC. Under the 1st option, Appia had the right to buy back 1 million of its shares at C $1 per share at any time prior to 31 August, 2008. Appia exercised this option. The 2nd option is conditional on Appia spending at least $10,000,000 on exploration on the Elliot Lake properties prior to 2 November, 2012, to define a NI 43-101 compliant uranium mineral resource on the property. This option grants Appia the right, prior that date, to buy back 9 million shares in tranches of 1 million shares at C $2 per share, subject to a price adjustment. The adjustment governs the maximum purchase price for the block of shares as follows:

> $0.10 times the NI 43-101 compliant Mineral Resources in pounds of U_3O_8.

In the event that the purchase price is less than $20 million, the option price of the 9 million shares will be adjusted to equal the maximum purchase price divided by 10 million. CEC retains a 1% uranium production payment royalty on uranium sold at a price equal to or in excess of US $130 per lb U_3O_8, as well as a 1% net smelter royalty on any precious and base metal co-production when the price of uranium equals or exceeds US $130 per lb U_3O_8.

Under the agreement with CEC, Appia is required to maintain the Property in good standing, including any claims returned (surrendered) to CEC. In turn, CEC is required to supplement the Property with any additional claim units that it acquires within 20 km of the Property boundaries subject only to Appia's acceptance of such new claim units. Appia is responsible for paying the acquisition (staking) costs of any claim units that it acquires from CEC.

Under an agreement dated 14 February, 2008, Appia purchased a group of claims from Dan Patrie Exploration Ltd. which retains a 1% net smelter royalty on the production and sale of any uranium from the subject claims at a time when the realized price for the uranium equals or exceeds US $130 per lb U_3O_8. The claims covered in this purchase agreement are:

- 3019312 and 3019313;
- 4215309; and,
- 4215313 to 4125315 inclusive.

One half of the royalty payable to Dan Patrie Exploration Ltd. may be purchased by Appia for C $1 million.

CEC transferred some surface rights to the City of Elliot Lake under an agreement dated 1 November 2005, and executed 22 November, 2005, to allow the construction of a road. The mining claims so affected were 4221245 and 4221246 (formerly 3009176 and 3009177).

A similar agreement on 12 January, 2009 transferred the surface rights for road construction to the City of Elliot Lake on claims 4215303, 4215313 and 4215303.

A block of claims in Buckles Township at the eastern end of the Appia Property were previously the subject of an option agreement between CEC and Energy Metals Corporation ("**EMC**") which had an option to earn a 50% interest. That option has been relinquished, and all outstanding shares of EMC have been purchased by Uranium One Inc. In exchange for terminating the option agreement, CEC issued C $250,000 worth of stock (250,000 common shares) of Appia to EMC (now Uranium One). In turn, CEC and now Appia, must maintain in good standing those claims that were subject to the original agreement until such time as Appia completes an initial public offering ("**IPO**"). In addition, Uranium One retains the right to participate in any Appia financing (for up to 9.9%) until and including an Appia IPO or reverse take-over. The claim block affected by the agreement is outlined on Figure 2 and identified as the "EMC Option". These claims cover the historical uranium resource located in the Teasdale Lake Zone which is described in later sections of this report. No other Appia claim units are under option to a second party at this time.

Lastly, an agreement on 22 July, 2009 conveyed Denison the right to construct a new tailings infrastructure on claims numbered 4221247 and 4221248 in exchange for a 3% net smelter royalty on any uranium production from the subject claims. Denison also granted Appia the right of access onto claims held by Denison in the Elliot Lake area as well as the right to use former Denison mine workings to facilitate the exploration and development of Appia's Elliot Lake Project.

APE REP / APE_02d_Claim_Map.dwg (Layout: 75k)
Last revision date: Thursday 1 September 2011

Watts, Griffis and McOuat

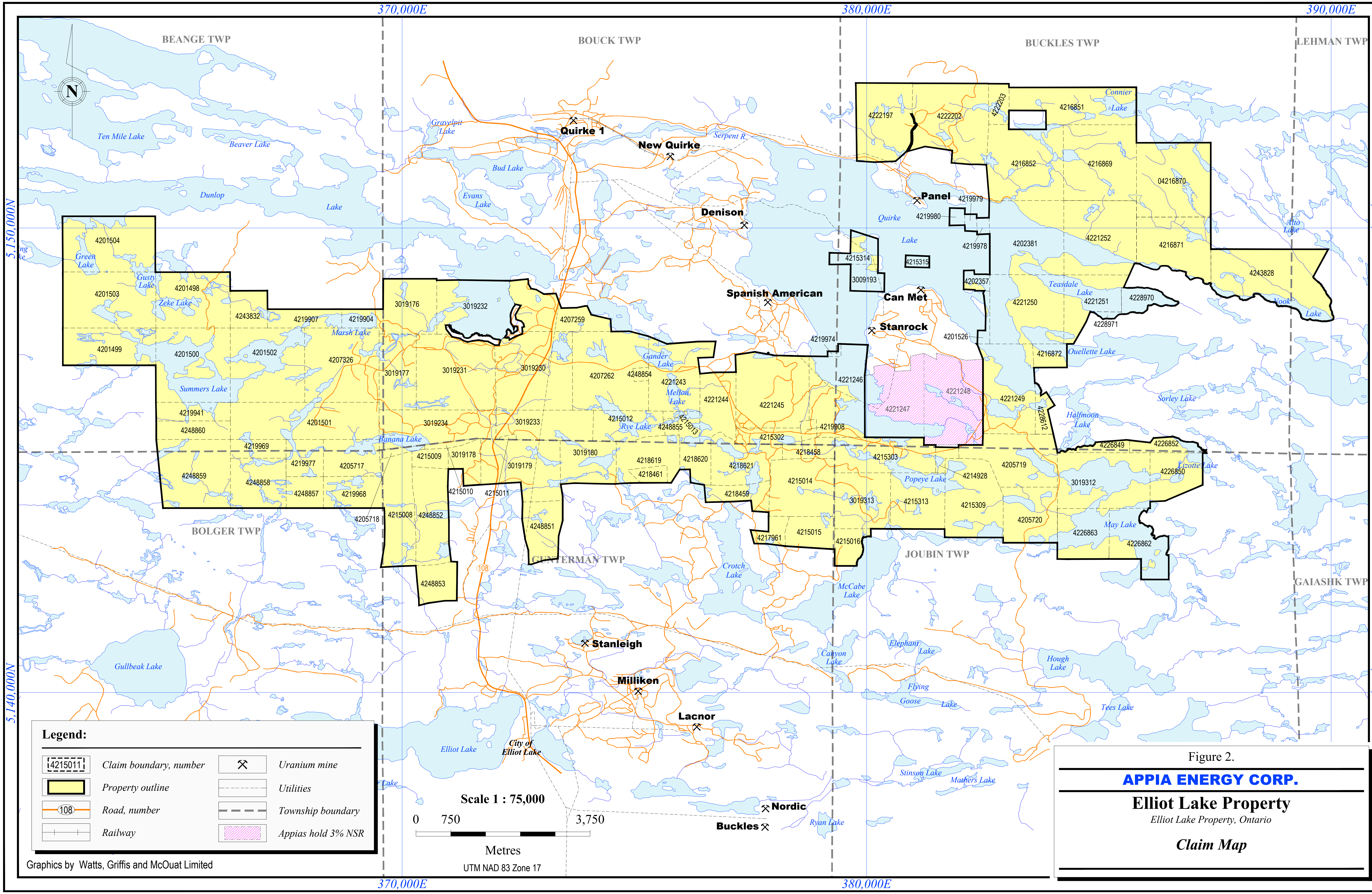


Figure 2.

APPIA ENERGY CORP.

Elliot Lake Property

Elliot Lake Property, Ontario

Claim Map

4. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

4.1 ACCESS

The Appia Property is located approximately mid-way between the city of Sudbury 126 km by road to the east and the city of Sault Ste. Marie 181 km to the west. It can be reached via the Trans-Canada Highway (#17), and then via Highway #108 approximately 26 km north to the town of Elliot Lake. The town can be reached by regular northern Ontario bus service, but it is not currently serviced by air. Regularly scheduled air travel from Toronto is available on a daily basis into both Sudbury and Sault Ste. Marie.

4.2 CLIMATE

The Elliot Lake area has a northern boreal climate, moderated by its proximity to Lake Huron, with warm summers and cold dry winters. The coldest months are January and February which average -17^o to -18^{o}C. The summers are hottest during July and August with maximum temperatures of 22^o to 24^{o}C, however, summer nights tend to be cool with minimum temperatures of 11^o to 12^{o}C.

Most of the precipitation in Elliot Lake falls during the spring months of April through May and during September-October. Absolute summer and winter temperatures are moderated by the areas proximity to Lake Huron, one of the largest of the Great Lakes. Although on a latitude equal to that of Kirkland Lake, the Elliot Lake area does not experience the cold weather that the former centre receives.

4.3 LOCAL RESOURCES

Elliot Lake with a 2006 population of 11,549 is a small fraction of its former size during the uranium boom of the 1970's when its population exceeded 30,000. It is now a local supply centre for recreation areas in the north, offering a wide variety of food sources as well as general mechanical supplies and services (equipment repair, welding, auto maintenance….etc). All the major Canadian banks are represented in the city: Royal Bank of Canada, TD-Canada Trust, Bank of Nova Scotia, CIBC and the Bank of Montreal.

The Ontario government maintains two offices in Elliot Lake: the Office of the Worker Advisor which operates under the Ministry of Labour, and an office of the Ministry of Northern Development and Mines (50 Hillside Dr. North, Elliot Lake ON P5A 1X4 - Telephone (705) 848-7133. The latter office is also a "Service Ontario" office which provides a broad range of administrative services for other ministries such as transportation and health (renewal of driver's licences and health cards).

A new integrated health centre has been constructed in Elliot Lake that houses the community's doctors and other health care professionals. The city is serviced with 24-hour 911-response ambulance service provided by the Algoma District Services Administration Board. The board provides one on-site ambulance and crew 24 hours a day and an additional crew on weekdays from 8 to 4 pm for transfers to service the other outlying areas. For emergency transportation to other centres, a helicopter landing pad is located at the Elliot Lake Hospital. Air Bravo Corporation operates an air ambulance service, servicing all of north-eastern Ontario and provides charter services. Policing services in Elliot Lake are provided by the Elliot Lake detachment of the Ontario Provincial Police (OPP). Officers patrol the streets and are on duty 24 hours a day 7 days a week. The Elliot Lake fire service provides 24 hour service with a complement 34 firefighters. They have a fully equipped fire hall with an aerial pumper and a complement of rescue vehicles.

Elliot Lake is located near the northern margin of the developed corridor along the Trans-Canada Highway. As a result, there are no paved roads extending more than 20 km north of the city. Elliot Lake Municipal Airport has no regularly scheduled flights, and is currently being used for occasional auto racing.

Local and long-distance communication facilities are well developed in Elliot Lake, and many hotels can provide internet services.

Most types of field supplies and equipment are readily available in Elliot Lake, although the selection is not as complete as might be found from major suppliers in the south. Outdoor recreation equipment is generally in good supply in order to support the local recreational community. Other supplies such as office equipment and materials are readily available.

4.4 INFRASTRUCTURE

The project is situated in the famous Elliot Lake uranium mining camp. Located at the end of a regional highway, the city of Elliot Lake contains a full complement of local Government, health, education and other services. The town has good drinking water, sewage treatment, communications and electrical services which are sufficient to support mining operations. A 4,500 ft (1,385 m) paved runway (46°21'N 82°34'W) is located about 6.4 km ESE of the town although it is not serviced by regular flights at this time. The runway has an ESE-WNW direction striking approximately 112 degrees. The location of other infrastructure relevant to mining is shown in Table 3.

Table 3
GPS Co-ordinates for Mine Infrastructure in the Appia Project Area Near Elliot Lake

Location	Geographic Location		UTM Location			Elevation
	Latitude	Longitude	Zone	Easting	Northing	(metres)
MINE WORKINGS						
Buckles Mine	46° 22.5865' N	82° 35.3287' W	17T	377812	5137101	345
Can-Met Mine	46° 28.8693' N	82° 32.8897' W	17T	381166	5148674	n.a.
Denison Mine	46° 29.5777' N	82° 35.8808' W	17T	377366	5150062	n.a.
Lacnor Mine	46° 23.7363' N	82° 36.5087' W	17T	376343	5139261	n.a.
Milliken Mine	46° 24.1363' N	82° 37.5085' W	17T	375077	5140027	n.a.
New Quirke Mine	46° 30.3595' N	82° 37.1497' W	17T	375773	5151543	n.a.
Nordic Mine	46° 22.8030' N	82° 35.3248' W	17T	377825	5137501	n.a.
Panel Mine	46° 29.9053' N	82° 32.9840' W	17T	381083	5150595	n.a.
Quirke 1 Mine	46° 30.7528' N	82° 38.7920' W	17T	373688	5152315	n.a.
Spanish American Mine	46° 28.6867' N	82° 35.4585' W	17T	377873	5148401	n.a.
Stanleigh Mine	46° 24.6828' N	82° 38.4148' W	17T	373937	5141063	n.a.
Stanrock Mine	46° 28.3820' N	82° 33.7012' W	17T	380110	5147792	n.a.

Note: WGM measured the location of the Buckles Mine shaft. All other co-ordinates were taken from MNDM records.

4.5 AGRICULTURE

There is relatively little agriculture in the project area due to the thin soils and the short growing period having only 112 frost-free days (versus 160 days for Toronto), both representing major obstacles to market-oriented agricultural development. Some private gardens are grown locally to produce vegetables for local consumption.

Silvaculture is a major industry in the area which produces pine and spruce for the construction industry, as well as cedar and a few hardwoods such as birch as a specialty woods. Some renewed cutting is expected in the area of the Appia property during the winter and extending into the summer of 2010.

4.6 PHYSIOGRAPHY

Located in the Canadian Shield, the project area is gently rolling with occasional bedrock scarps as much as 25 m in height (Plate 1). Elevations range from approximately 300 to 500 metres above sea level. The city of Elliot Lake is situated at 312 m above sea level. The area is dotted with a great number of lakes which is typical of the shield. The largest of these is Quirke Lake. The lakes drain towards the south into the North Channel, a body of water which forms part of Lake Huron.

Soils in the project area are generally thin as a result of protracted periods of glaciation during the Pleistocene. Areas between bedrock ridges are generally filled with glacial till with an upper muskeg or peat-covered surface. Drainage may be poor locally.

Plate 1: Winter view of terrain in the Blind River Area.

5. HISTORY

5.1 REGIONAL EXPLORATION HISTORY

The discovery of pitchblende on the shore of Great Bear Lake, NWT in 1930 and the discovery of uranium at Beaverlodge, northern Saskatchewan in 1952 broke the monopoly that the Belgian Congo had on the production or uranium ores (Lonn, 1966). During 1948, a modest staking rush occurred in the area now known as the Blind River District. Several samples from Long Township, 122 km east of Sault Ste. Marie contained low but measurable amounts of uranium. Having examined mineralized samples during 1949, famed geologist Frank Joubin was convinced that surface oxidation of pyrite had resulted in the acidic leaching of uranium from the rocks. Joubin managed to persuade Joe Hirshhorn to finance a drilling program at Elliot Lake. Of 56 samples sent for analysis, 50 returned values that were economically interesting averaging 0.11% U_3O_8. Convinced they were onto a major discovery, they flew in stakers and managed to stake 1,400 claims covering 56,000 acres which were simultaneously filed on 11 July, 1953 within the prescribed 30 day period of the first claim date. The claims were parcelled into groups, each group allocated to a newly formed company.

Two weeks after Joubin and Hirshhorn registered their claims, Art Stollery, Fred Jowsey and James Kenmey staked 83 claims on what they considered to be the best remaining ground. Stephen B. Roman, convinced that they had something good, optioned the claims through his company North Denison Mines Ltd. paying $30,000 in cash and 500,000 shares. The first drill hole was completed to a depth of 2,706 feet in late 1954. Although this hole failed to intersect economically interesting mineralization, the next 28 holes were successful, outlining a uranium deposit that was more than 2.4 km in length totalling more than 200 million tons grading an estimated 2.5 lbs U_3O_8 per ton. It was on the foundations of this discovery that the Denison mining empire was founded.

The surface exploration work and diamond drilling initially carried out in the Elliot Lake area in the 1960s and 1970s, and in areas now held by the Appia, was completed as part of the deposit evaluation and ore definition process that gave rise to the historical mines. Little work was done during the 1980s as uranium prices were in decline.

5.2 MINING HISTORY

5.2.1 General Overview

During 1956, the Quirke Mine at Quirke Lake and the Nordin Mine near Elliot Lake commenced operations under the new companies Preston East Dome and Algom Uranium Mines Limited. Eldorado, the federal Crown corporation which was the sole buyer of Canadian uranium production, gave a $206M uranium supply contract to Algom and a $55M contract to Pronto. However, before the Algom Mine could begin production, the company was taken over by the U.K.'s Rio Tinto Limited (Rio Tinto). By the end of 1957, Rio Tinto had also bought control of Nordic Uranium Mines Ltd. and merged its interests in three additional mines into Northspan Uranium Mines Limited. Finally Rio Tinto acquired Milliken Lake Uranium Mines from Hirshhorn. By the end of 1958, Rio Tinto had seven mines in operation supplying 40% of Canada's uranium concentrate production: Algom Quirke, Nordic, Pronto, Milliken Lake and three Northspan mines.

At this same time, another small explorer named Stanrock Uranium Mining Ltd. commissioned its mill in 1958 and started production. Realizing the value of high yttrium contents in the Elliot Lake ores, Stanrock began producing yttrium as a by product in 1965. The production was quite simple as the metal went into solution together with uranium. After the uranium ores was stripped from the pregnant solution, the leachate containing approximately 75% of the Y and 20% of the other REEs plus some thorium was neutralized with lime and injected air in Pachuka tanks to a pH of about 8.5. Following this, the oxidized slurry was thickened and the sediment bearing Y-rich underflow was recovered for further treatment. Yttrium and rare earths were re-dissolved using sulphuric acid to generate a solution with a pH of about 4.2 from which other metal solids (Fe, Th, Al) were filtered off. The resulting second stage solution was then neutralized with ammonia gas causing the rare earths and yttrium to be precipitated. The sludge was then thickened and dried (Gupta & Krishnamurthy, 2005).

During this same period, Denison sank two shafts on its discovery, one a 5-compartment and the other a 7-compartment shaft, and a mill was constructed to process 6,000 tons per day. Eventually reorganized as Denison Mines Ltd., the company negotiated a $280,600,000 contract to supply 28 M lbs of U_3O_8 to the United States between 1957 and November, 1963. When supply contracts to the United Kingdom were added to this, nearly $500M of uranium was sold by 1963.

In 1959, the United States announced that it would no longer accept Canadian uranium production, although existing contracts were extended into 1966. As a result, the Algom, Northspan, Pronto and Milliken Mines were reorganized under a single company, Rio Algom Mines Ltd. However, as contracted deliveries were completed, the mines closed until only the Nordic Mine and the Denison Mine were operating during 1965. Denison's production fell from 5,379,168 lbs of U_3O_8 during 1961 to 3,950,364 lbs during 1964 while during the same period uranium recovery rose from 93.18% to 95.57%.

In 1966, Stephen Roman forecast that uranium consumption for peaceful nuclear power generation would soon outpace predicted uranium requirements for all other purposes. He was correct, but international forces intervened in the supply-demand curve, and this had a profound impact not only on mine production, but also on uranium exploration in Canada.

Having observed the Stanrock yttrium operation, Denison decided to capitalize on the growing market for yttrium which had previously been identified as a potential by-product in Elliot Lake ores. In 1966 a yttrium circuit was added to Denison's mill and production started later that year with 10,307 kg (22,724 lbs) of Y_2O_3 produced. The following year, the Elliot Lake camp reached a zenith in its output with 78,268 kg (172,551 lbs) of Y_2O_3 produced (Canadian Minerals Yearbook). The camp's output gradually diminished as the US market turned more and more to lower cost production from its own mines, including the Mountain Pass Mine in California, a major producer of cerium and lanthanum. By 1970, the output was only 33,112 kg (73,000 lbs). No production was recorded in 1971 or '72. Stanrock merged with Denison Mines Ltd. in 1973, a year that saw only 181 kg (400 lbs) of Y_2O_3 produced, but the yttrium market revived the following year which saw a collective output of 39,366 kg (86,787 lbs) of Y_2O_3 from the Elliot Lake mines. During the period 1975 through 1977, output from the Denison mine alone averaged 30,545 kg (67,340 lbs) of yttrium oxide, however by 1978 yttrium production became uneconomic due to increased reagent costs.

The forces that created the soaring demand for uranium to fuel nuclear reactors for electrical consumption were given additional impetus by the oil shocks that occurred during the mid-1970s, in no way significantly different from the forces that have pushed uranium spot prices from less than $10 per pound of U_3O_8 in the early part of this decade to more than $120 per pound in early 1997.

Driven by market demand, the international price for uranium oxide rose above all previous highs reaching $43.40 per pound during the summer of 1978. This up-swing in commodity prices enabled many of the Elliot Lake uranium mines to resume production, including the Agnew Lake Mine to the east, and fuelled a second uranium exploration boom in the Elliot Lake area.

Those forces contended with the Three Mile Island accident on 30 March, 1979, described by veteran news commentator Walter Cronkite as “the worst nuclear accident of the atomic age” (Stephens, 1980). The fact that the accident was in fact a faulty pressure release valve that resulted in only a minor release of radioactivity was lost on the general public, and a major slow-down in reactor construction in the United States did result. What hurt the uranium exploration sector and mining industry far more was the ever accumulating overhang in uranium stockpiles.

In the late 1980s, the main contractor for uranium from Elliot Lake mines was the province’s public energy utility Ontario Hydro. Political pressure on the government and softening international uranium prices forced the government to renegotiate its contracts with Denison Mines Ltd. Faced with high mining costs, the last remaining uranium mines in the Blind River Area were forced to close. Before closure, the Denison and Agnew Lake mines attempted various innovative means to drastically reduce mining costs, such as through in-stope flooding (in-situ leaching) and heap leaching, but recoveries failed to meet expectations. In 1985, Denison evaluated the potential of supplying 300,000 pounds of yttrium oxide per year to Japan, a plan that was never realized as a result of the company’s inability to sustain operations at its uranium mine.

The Agnew Lake Mine, located 80 km west of Sudbury in Hyman Twp., experienced similar difficulties with the down-turn in uranium markets brought about by the closure of the United States markets to Canadian uranium. Development work was suspended in 1970 due to low uranium prices, but by the mid 1970s recovering uranium prices supported a decision to dewater the mine to the 535 m level (1,750’). In preparation for mining, a decline was driven from surface to the 580 m (1900 foot) level. It was collared on the north side of a ledge about 760 m south-southwest of the shaft. Underground development then proceeded to prepare a test stope for in-situ leaching (“**ISL**”), a relatively new technology at the time.
ISL was developed for use in fast-tracking sandstone-hosted uranium deposits to production in the south-western United States. Rather than stripping overburden and open pit mining low grade resources, ISL allowed leachate to be injected into the uranium bearing formation via a series of injection wells, and extracted from the formation by a second series of wells. An outer ring of holes was used to dewater the formation and prevent leachate from migrating beyond the vicinity of the deposit and contaminating important aquifers. The holes

were cased to the depth of the ore-bearing horizon. Key concerns for the use of ISL include the mineralogy of the uranium (must be ISL-leachable) and the permeability and porosity characteristics of the host formation. Excessive clay alteration, for example, impedes leachate flow and uranium recoveries. Oxidation of the formation is also necessary to liberate uranium and a failure to provide sufficient oxidation can dramatically depress recoveries.

At the Agnew Lake Mine, the comparatively low primary permeability in the host formation prevented the use of conventional ISL. Therefore, the mine stope selected was prepared by closely spaced blast-hole development, and then explosives were used to induce permeability by pre-fracturing the ore. Leachate was then pumped into the sealed stope and re-circulated for a period of time. Uranium oxide was precipitated from the pregnant solution. The success of the Agnew Lake ISL test program led to a production decision in June, 1977 at a proposed production rate of 455,000 kg of U_3O_8 per year to complement mine production from conventional long-hole, blast-hole stoping.

By the end of 1980, Kerr had 3,397,000 tonnes of material actively being leached. Initially a sprinkler system was used to spray the ore with leachate, but in full-scale operation, the overall leach efficiency (recovery rate) was lower than the test case. As a result, the sprinkler system was replaced by a flood leach system to enhance the recovery of uranium through greater saturation of the blasted and fractured in-situ ore by leachate (Lang and Morrey, 1976). Despite Kerr's best efforts, the mine failed to achieve the anticipated rates of production, and underground development was terminated in May, 1980.

The 1984-85 Canadian Mines Handbook reports that, during 1982, 2,221,000 tons (2,130,000 t) of broken in-situ ore and 1,449,000 tons (1,315,000 t) of surface stockpiled ore was continuously leached until November when the leachate was drained in preparation for mine closure. The amount of uranium recovered from this 3.536 Mt of ore was not reported. All leaching ceased in early 1983 and production amounted to only 39,031 lbs or 19,533 kg of U_3O_8 that year.

At one time, 13 uranium mines operated at Elliot Lake, most of which were owned by Rio Algom Limited as follows in Table 4. However the largest mine was the Denison Mine, and its production served as the foundation of the company that bore its name.

Table 4
Summary of Elliot Lake Mining Operations

Mine	Period of Operation	Production
Denison Mines Limited Operations		
Can-Met Mine	1957-1960	2.6 M tons of ore
Denison Mine	1957-1992	59 M tons of ore
Stanrock Mine *1	1958-1964; 1964-1970*2	+/- 6.9 M tons of ore
Rio Algom Limited Operations		
Algom (Buckles) Mine *3	1955-1958	124,890 tons of ore
Lacnor Mine	1956-1960	3.4 M tons of ore
Nordic Mine	1957-1968	13 M tons of ore
Milliken Mine	1957-1964	6.3 M tons of ore
Panel Mine	1957-1961; 1978-1990	15 M tons of ore
Pronto Mine *4	1955-1970	2.3 M tons of ore
Quirke Mine 1	1955-1961; 1965-1990	44 M tons of ore
Quirke Mine 2		production uncertain
Spanish-American Mine	1956-1960	276,000 tons of ore
Stanleigh Mine	1956-1960; 1982-1996	14 M tons of ore

*1 Amalgamated with the Denison Mine in 1973
*2 Post-1964 production was from bio-leaching
*3 Ore was milled at the Spanish American and Lacnor Mills
*4 Pronto Mill changed over to copper processing from 1960-1970

Much can be learned from the mining history of the camp. The mining of deeper and lower grading ores as near surface resources were depleted, offers insight into what might be accomplished today given significantly higher commodity prices. Most of this mining was completed using conventional room and pillar methods. The miners of the time also used innovative techniques including in-situ leaching and bio-leaching as alternative lower cost methods of production. The possibility that such techniques could be modified for use at present needs to be carefully assessed.

Denison Mines was one of the innovators in respect to the application of bio-leach technology. Since the early 1960s, the company used bacterial leaching as a salvage method for recovering additional uranium from mined out stopes, waste piles, ore left behind after mining and from pillars. At the Stanrock Mine, an independently developed bio-leaching program was implemented in 1964 and the following year 147,750 lbs of uranium oxide were produced using this technique. Bioleaching at the Stanrock operation continued until sometime in 1970. Stanrock's technology was developed independently and it was not until its amalgamation with Denison in 1973 that the two technologies were merged.

The "in-place" uranium bioleaching programs practiced at Elliott Lake consisted in part of spraying acidified mine water into mined-out stopes. Some flooding of stopes was also attempted, and additional in-place leaching was practiced on blasted, rubblized ore according to McCready and Gould (1990). Because the Elliot Lake area experiences cold winters, a distinct improvement in uranium recovery was observed during the warmer months. Biologically induced oxidation of the pyrite in the uranium ores generates sulphuric acid in place, and this in turn leaches uranium in the presence of an oxidant, namely ferric ions generated from bio-oxidation of pyrite. Similar processes are known to occur naturally in the Witwatersrand, South Africa where some mine waters can contain moderately elevated uranium levels. Acidophilic iron-oxidizing bacteria are also able to leach uranium by oxidizing U^{4+} to U^{6+} in dilute sulphuric acid solution. The mechanism is generally considered to be indirect, i.e. the organisms maintain a high solution redox potential through oxidation of ferrous ions derived from iron sulphides in the ore. Ferric ions oxidize uraninite (UO_2) to UO_2^{2+} which then forms soluble $[UO_2(SO_4)_n]^{2-2n}$ species.

Denison established a task force in 1982 to examine the broader application of bacterial leaching to the recovery of uranium from its ores as a primary mining method (Marchbank). Denison's research contributed to a great improvement in the effectiveness of the company's salvage operations. Follow-up laboratory work, financially and technically supported by CanMet, resulted in leach efficiencies of +/- 75% being achieved from trickle leaching and flood leaching. As a result, a decision was made in 1984 to proceed with full scale flood leach tests involving taking down pairs of stopes after conventional mining is completed. The prepared stopes were then sealed with concrete bulkheads and flooded and drained on a monthly basis over a period of 18 months to achieve 70% extraction. At one point, Denison had 90 flood leaching stopes in varying stages of operation, and more than 840,000 lbs of uranium oxide came from bacterial leaching in 1987 (Marchbank). Recovery efficiencies were more or less governed by the size of ore fragmentation, however as the rock tended to break along mineralized planes, a direct relationship did not exist as many of the larger block sizes were generally unmineralized. A fragmentation size of 73% passing 4 inch (10 cm) screen was achieved using a 61 x 122 cm (2'x4') drilling pattern. After initial flooding, draining is required to provide oxygenation as part of the sulphide oxidation process. Additional air was also provided from 2 inch polyethylene pipes laid on the floor of the stopes before blasting. Heightened radon release was one undesirable collateral effect of the bioleach process resulting from the large quantities of broken rock underground. Additional ventilation requirements were met by both increased airflow and an exhaust system to draw off radon. Ventilation eventually became a major operating cost item in the Denison Mine.

Collectively, the foregoing Denison mines produced some 156 Mlbs of U_3O_8 from 75 M tons of ore grading approximately 2.1 lbs U_3O_8 per ton. The Rio Algom mines produced approximately 206 Mlbs of U_3O_8 from 92 M tons of ore grading approximately 2.3 lbs U_3O_8 per ton. The total production was approximately 362 Mlbs of U_3O_8.

Total production data (tonnes, grade, recovered U_3O_8) from individual mines is not well documented in public sources, although WGM believes that such information is probably contained in annual production summaries prepared by the Federal Government. Some information is available from the annual Canadian Minerals Yearbook and from Northern Miner Magazine archives.

The mining history for each of the mines is summarized in the following sections. These former producers are now managed under the Federal Nuclear Safety Commission and the Joint Review Commission, a body composed of Ontario government ministries and federal departments.

5.2.2 Denison Mines Limited

Can-Met Mine

The Can-Met Mine had a brief history of production commencing in May, 1958 and ending in April, 1961. During 1958 and 1959, production totalled approximately 2,495,709 lbs of U_3O_8 from 1,477,160 tons of uranium ore averaging approximately 1.8 lbs/ton. The estimated production for 1960 was 1.1 M tons of ore at a similar grade.

Denison Mine

The Denison Mine was one of the great success stories of the Elliot Lake camp. In its first year of production in 1957, the mine produced some 2,145,360 lbs of U_3O_8 from 908,972 tons of ore averaging 2.36 lbs/ton. The initial mill capacity was 3,000 tons/day and throughput for the first year averaged 2,676 tons/day. During the second and third years, capacity was doubled and throughput rose to an average of 5,672 tons by the end of 1959. During 1962, the milling rate was reduced as higher grade ores were mined – total production in 1963 was 5,078,760 lbs of U_3O_8 from 1,586,600 tons of ore averaging 3.2 lbs/ton. Denison's generally higher grades persisted through 1971 after which uranium grades gradually declined. In the meantime, the plant went through a number of modifications with the addition of a yttrium oxide circuit in 1967. The plant was up-graded several times, and as Denison amalgamated with Stanrock Mines in 1973, up-grading of the mill and mechanization of the mine continued such that the uranium mill capacity was increased to 6,000 tons/day in 1976 and to 10,000 tons/day in 1979. The increased throughput was also implemented to allow Denison to maintain uranium output using lower grade ores which were averaging 2.03 lbs/ton during 1979 (4,495,757 lbs U_3O_8 produced). Mill capacity was further increased to 15,000 tons/day in 1981 and the following year, production reached a record high of 6,132,000 lbs of U_3O_8 from 4,025,000 tons of ore averaging 1.65 lbs/ton.

During 1984, 5,840,000 lbs of U_3O_8 were produced, including 513,000 lbs from a heap leaching operation. During 1987, bacterial leaching was tested for the first time and 840,000 lbs of U_3O_8 was recovered. Having produced more than 5 M lbs of U_3O_8 in 1988, Denison's production commenced a rapid decline which saw only 3.56 M lbs produced in 1990 and approximately the same amount during 1991. Underground production ceased on 11 March, 1992, with the mine producing 727,576 lbs of U_3O_8 from 464,163 tons of ore grading 1.65 lbs/ton. Total production for the mine was 146,618,806 lbs of U_3O_8 from 69,484,027 tons of ore grading 2.2 lbs/ton. The average life of mine metal recovery was 95.4%.

The Denison Mine was also a major producer of yttrium oxide concentrates as a by-product. According to the Canadian Minerals Yearbook for 1980, the yttrium concentrates averaged 60% total rare earths of which the relative rare metal contents were 0.8% La_2O_3, 3.7% CeO_2, 1.0% Pr_6O_{11}, 4.1% Nd_2O_3, 4.5% Sm_2O_3, 0.2% Eu_2O_3, 8.5% Gd_2O_3, 1.2% Tb_4O_7, 11.2% Dy_2O_3, 2.6% Ho_2O_3, 5.5% Er_2O_3, 0.9% Tm_2O_3, 4.0% Yb_2O_3, 0.4% Lu_2O_3 and 51.4% Y_2O_3. The recovery of total REEs to the concentrate averaged approximately 88.6%. Following the leaching of uranium ores and the stripping of uranium from the pregnant solution, the leachate contained approximately 75% of the Y and 20% of the other REEs from the ore plus some thorium. Lime and injected air was used to reduce the acidity of the solution in Pachuka tanks to a pH of about 8.5. The slurry was then thickened, and following decantation the yttrium-rich sediment was recovered for further treatment. Yttrium and rare earths were re-dissolved using sulphuric acid to generate a solution with a pH of about 4.2 from which other metal solids (Fe, Th, Al) were filtered off from the second stage solution. The rare earths were then precipitated a second time using ammonia gas, thickened and dried to produce a yttrium-rich mischmetal. (Gupta & Krishnamurthy, 2005).

Stanrock Mine

Following the sinking of two shafts to 3,000 feet, the Stanrock Mine likely produced approximately 528,000 tons of ore during 1958. Mill capacity was 3,000 tons/day and approximately 822,000 lbs of U_3O_8 were recovered. Ore treatment and uranium output are thought to have doubled the following year. Production reached a new high during 1961 when 2,103,688 lbs of U_3O_8 were recovered from 1,111,442 tons of ore indicating a recovered grade of 1.89 lbs per ton. Conventional mining ceased during October, 1964, however a yttrium circuit was added in 1965 and a small amount of yttrium concentrate was produced. By that date, approximately 6,898,000 tons of ore had been mined from which 11,508,000 lbs of U_3O_8 had been produced (recovered grade = 1.67 lbs/ton).

A bio-leaching program was implemented in 1964 and production of 147,750 lbs of uranium oxide was reported in 1965 followed by 142,806 lbs during 1966. Bioleaching continued until sometime in 1970, but additional production data were not available to WGM. The mine was placed on care and maintenance during 1971, and despite being acquired by Denison Mines through a corporate amalgamation on 12 February, 1973, the Stanrock Mine never returned to production.

5.2.3 Rio Algom Mines Ltd.

Algom Mine

The Algom Mine started mining on 21 October, 1957 with a mill rated at 3,000 tons per day starting production on 1 May of the following year. The mine closed on 30 September, 1959 after producing 2,495,709 lbs of U_3O_8 from 1,477,160 tons of ore grading approximately 1.8 lbs U_3O_8 per ton. Average mill throughput was actually 2,485 tons per day.

Lacnor Mine

Few if any details of production from the Lacnor Mine are available because its production was consolidated with and reported as part of Rio Algom's total production. A summary record indicates that the mine produced 3.4 M tons of uranium ore between 1956 and 1960. A mill with a capacity of 3,800 tons/day was constructed during 1957 and production may have actually commenced during September of that year.

Nordic Mine

The Nordic Mine commenced production in 1957 with a mill rated at 3,000 tons/day, and maintained an average throughput of 2,722 tons/day. The mine closed in 1959 having milled a total of 3,131,826 tons from which 7,162,303 lbs of U_3O_8 were produced for an average recovered grade of 2.29 lbs/ton (2.46 lbs/ton ore grade). Interestingly, the Nordic Mine was Canada's first producer of REE-bearing yttrium concentrates in 1964 however there appears to be no record as to the specific amounts produced.

Milliken Mine

A 3,000 ton/day mill commended operations on 11 March, 1958 at Milliken. Throughput that year averaged 2,575 tons/day, however output of 3,048 tons/day somewhat exceeded design capacity during 1959. During those two years, the mill processed 1,796,789 tons of ore and produced approximately 3.17 M lbs of U_3O_8. After 1959, the reports available to WGM showed mine production consolidated with other Rio Algom mines. The Milliken Mine produced for several years after that date, reportedly closing in 1964 after producing 6.4 M tons of ore.

Panel Mine

A 3,000 ton/day mill was constructed at the Panel Mine. The mill commenced operations on 11 March, 1958 and closed on 30 June, 1964. During 1976, engineering studies were undertaken pursuant to increasing mill capacity to 3,300 tons/day and reopening the mine in late 1979. As of the end of 1978, \$71.8 M had been spent on refurbishment, and the mine restarted operations in 1980 producing 1,006,000 tons of ore (2,883 tons/day) grading 1.7 lbs of U_3O_8 per ton for 1,897,000 lbs of recovered uranium oxide. The mined grade increased to 2.0 lbs/ton during 1981 and likely declined thereafter.

Production at the Panel Mine is reported by Rio Algom in consolidation with others of its mines. Production in 1981 totalled 2,149,000 lbs of U_3O_8 from 1,106,000 tons of ore. The mine continued some operations until its official closing on 31 August, 1990, however there appears to have been little or no production after 1988. Experiments with underground bacterial leaching were carried out during 1986 and the program was expanded during 1987. In 1988, the mine produced 370,000 lbs of U_3O_8 from its underground leaching program. It is not know how much of this production, if any, was derived from conventional milling.

Pronto Mine

Construction of a 1,000 ton/day mill at the Pronto Mine commenced during 1956 and production followed the next year, totalling 1,972,521 lbs of U_3O_8 from only 507,122 tons of ore (recovered grade = 3.9 lbs/ton). Operations were suspended in May, 1960 by which time 7,007,999 lbs of uranium oxide had been produced from 1,633,788 tons of ore at an average recovered grade of 4.3 lbs/ton, a relatively high grade for the Elliot Lake camp. After uranium production ceased, the mill changed over to copper production and this operation continued until 1970 at a rate of 600-700 tons/day. During 1980, Rio Algom undertook studies to resume uranium production at Pronto, but declining prices prevented the mine's reactivation.

Quirke Mine 1

The Quirke Mine was one of Rio Algom's more important uranium deposits at Elliot Lake. During late November 1956, a vertical shaft was constructed to a target depth of 1,220 feet with development on 9 levels. A 3,000 ton/day mill was constructed. Mine production commenced during 1958 with the production of 2,178,171 lbs of U_3O_8 from 963,835 tons of ore averaging 2.43 lbs/ton. The mine closed in January, 1961, but last reported production for 1960. Total mine output was 1,962,652 tons of uranium ore averaging 2.4 lbs/ton from which 4,437,377 lbs of U_3O_8 were recovered (93.0% recovery).

During 1966, the mine workings were dewatered and renovation of the mill was initiated. With modifications completed the following year, the mine was reopened with a mill capacity of 3,300 tons/day. The mill was further up-graded in 1970 to a design rate of 4,500 tons/day, however, the mine and mill were shut down at the end of 1971. A third expansion of the mill was undertaken during 1975 at a planned cost of C $76 M to increase capacity to 7,000 tons/day, and completed in 1978 at an actual cost of $68.9 M. Mine output was not reported separately during this period of time. Reports state that the mill ran at an average throughput of 6,223 tons/day during 1978 and at design capacity the following year (7,004 tons/day). The mill was used as Rio Algom's main regional facility during the 1980's processing predominantly Stanleigh Mine ore during 1990 and thereafter until the Stanleigh's closure in late 1996. A summary of mine production indicates that 44 M tons of ore were produced from the Quirke Mine.

New Quirke Mine

Development of the New Quirke Mine commenced during 1965. Rather than constructing a new mill, Rio Algom elected to refurbish and increase the capacity at its existing Quirke Mine located only 2.4 kilometres away. Production from the new mine commenced in October, 1968. No detailed records prior to 1978 were available to WGM for the mines production due to Rio Algom's tendency to report consolidated production data. During 1978, the mine produced 4,952,000 lbs of uranium oxide from 2,166,000 tons of ore having an average grade of 2.3 lbs/ton. The ore was processed at the original Quirke mill and uranium recovery reportedly averaged 99% during the year. The following year, production increased to 5,294,000 lbs of U_3O_8 from 2,452,000 tons of ore at the same grade (94% recovery). Production was sustained at between approximately 4.5 M lbs and 5.5 M lbs until 1986.

Experiments with underground bacterial leaching were carried out during 1986 and the program was expanded the following year. No specific mention has been made concerning uranium production from this program, and it seems to have been discontinued in 1988 probably due to less than satisfactory results. The grade of the bore being leached is not reported in the general literature available. Mining operations ceased on 31 August, 1990 after nearly 22 years of continuous activity. Partial records covering about eight years of operations (1978-1986) show production of 23.3 M tons of ore from which 45.5 M lbs of U_3O_8 were produced making this one of Rio Algom's great mines.

Spanish-American Mine

A 2,000 ton/day mill was constructed at the Spanish-American Mine in 1957, but the mine closed little more than a year later in February, 1959. The total reported production was 276,000 tons of ore of an uncertain grade. In response to rising uranium prices, a preliminary study was undertaken during 1980 to assess the feasibility of reopening the mine, and resuming production at the mine remained part of Rio Algom's long term plan as late as 1988.

Stanleigh Mine

Stanleigh was the last of the Elliot Lake Mines to close, ceasing production in June, 1996. The initial mine development occurred in 1958 and a 1,500 ton/day mill was constructed. That year, 210,561 tons of ore were produced having a low average grade of only 1.5 lbs U_3O_8 per ton from which 293,166 lbs of uranium oxide were produced. Recovery averaged 93%. Mill capacity was doubled in 1959 and the mining of higher grading ores (2.1 lbs/ton) led to production of nearly 1.7 M lbs of U_3O_8. Production was suspended on 30 November, 1960 due to the low grades and was not resumed until mid-1983. During the intervening period, 15,300 m (50,200 ft) of mostly successful deep diamond drilling was completed in 1967, but despite this, most of the plant and mine equipment was sold during 1969.

In 1975, mineral economics studies were undertaken to re-examine the possibility of reopening the mine under stronger uranium market conditions. A housing project was started in 1979 and refurbishment of the mill commenced with a goal of resuming production in mid-1983. Rio Algom met its target and the mine reopened that year, with the mill's design capacity (4,250 tons/day) being achieved in March-April, 1984. Production figures are available for the period 1988 through 1996. Ore grade varied between 1.6 and 2.0 lbs U_3O_8 per ton during that period. Mine throughput was initially 3.5 M tons per year, however, after 1989 it rapidly declined to approximately 900,000 tons/year (+/-250,000). The production of uranium oxide declined from 6,100,000 lbs in 1988 to 1,400,000 in 1991 before returning to a level of approximately 1,800,000 during the period 1992 through 1995. The mine produced 1,055,000 lbs of U_3O_8 from ores estimated to grade approximately 1.6 lbs/ton during 1996 in the nine months leading up to the mine's closure. The mine is thought to have produced between 14.0 and 15.7 M tons of ore.

5.3 HISTORICAL RESERVES AND RESOURCES

5.3.1 General Overview

As mentioned in the foregoing, the closure of the Elliot Lake Mines was triggered by a collapse in uranium prices due to a tremendous over-supply of uranium on the world market far exceeding any demands from the military or from energy utilities. The inventory of uranium in various forms had been building for more than 20 years, and the fall in prices came as no great surprise to those working in the industry at the time. Mining in the Elliot Lake camp continued despite the new economic conditions due largely to long-term supply contracts that Rio Algom and Denison had negotiated with Ontario Hydro and a few other energy utilities. As these contracts were satisfied or, in the case of Ontario Hydro, cancelled through a buy-out negotiation, the mines were faced with the reality of substantially lower revenue and ever escalating costs. As a result, the mines closed leaving considerable lower grading uranium resources in the ground. A related aspect of the closure was the loss of jobs and expertise in the uranium sector that even today cannot be easily replaced.

At the time of closure, it was simply assumed that Elliot Lake would never again produce uranium, nor would the region be of interest for uranium due to the higher grades found in the Athabasca Basin, Saskatchewan. All mining infrastructure was removed and the sites underwent a program of restoration that continues today. Little thought was given to the substantial undeveloped resources remaining at Elliot Lake (Figure 3) as well as resources remaining in mine pillars.

With the run-up in prices seen during 2006 and 2007 when they were poised to exceed the inflation-adjusted record uranium market prices established during the period 1977-1979, the Elliot Lake area enjoyed a renaissance. The exploration drilling by Pele Mountain Resources ("**PMR**") that defined new Mineral Resources in Pecors Township is proof of both renewed interest and the potential for success. The mineralization on PMR property was known previously from considerable exploration work that outlined the uranium-bearing zone several decades ago, a fact that is not apparent to those acquiring the information from the PMR website. This deposit is situated approximately 10 km south of the Appia claim block. PMR have announced a NI 43-101 compliant Inferred Mineral Resource of 30.05 million tonnes grading 0.05% U_3O_8 (1.0 lbs U_3O_8 per short ton) having a minimum thickness of 2.44 m (no average thickness given) and using a cut-off of 0.03% U_3O_8 (RPA, 2007). The company has also stated that it believes that additional (conceptual) potential exists for 25 to 30 million tonnes of mineralization at grades of 0.04% to 0.05% U_3O_8.

Known uranium mineralization occurs in five main areas of the Appia property based on drill hole evidence, summarized as follows:

Teasdale Lake Zone	located in Buckles Township approximately 1 km east of the former Can-Met Mine and situated obliquely on strike (and down dip) about 4 km southeast of the Panel Mine.
Gemico Block 3	located on boundary between Buckles and Joubin Townships and situated obliquely down-plunge from the Stanrock Mine
Gemico Block 10	located in south-eastern Bouck Township and down-dip of the Spanish American Mine
Banana Lake Zone	located in Beange Township and western Bouck Township, and situated in the centre of the Quirke Lake Syncline.
The Canuc Zones	located in west-central Bouck Township, and situated southwest of the Spanish American Mine in an area not intensively drilled.

These zones are described in greater detail in the following sections. The historical drill hole locations are shown in Figure 4. Outlines of the major ore zones are shown as blue (Nordic) and green (Quirke) dashed lines. The poorly defined southern boundary of the Quirke Zone has recently been reassessed by Alan MacEachern based on the assumed position of the pinch-out of the uranium-bearing Ryan Member of the Matinenda Formation. This interpretation is also shown on Figure 4 based on the assessment report prepared by MacEachern for Appia (MacEachern, 2009).

APE REP / APE_09a_Historical_U_Resources_20k.dwg (Layout: 75k)
Last revision date: Tuesday 19 July 2011

Watts, Griffis and McOuat

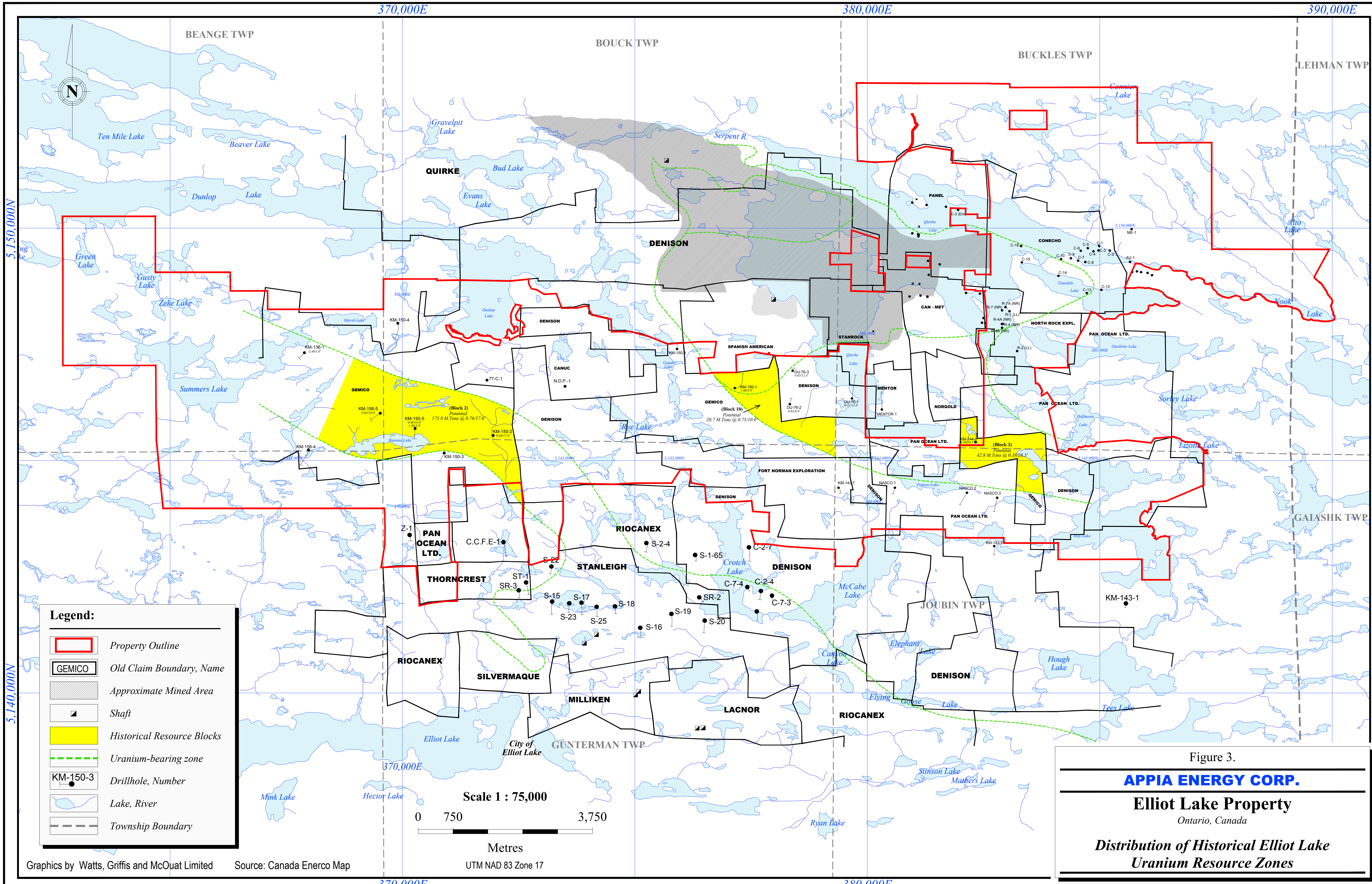


Figure 3.

APPIA ENERGY CORP.

Elliot Lake Property

Ontario, Canada

Distribution of Historical Elliot Lake Uranium Resource Zones

5.3.2 Teasdale Lake Zone

The area near Teasdale Lake (Figure 4) has been drilled during many periods, but the major drilling programs were completed during the mid-1950s as follows:

1954-1955	Conecho Mines Ltd.	19 diamond drill holes – 9 holes not filed with Mining Recorder.
1954-1956	San Antonio Gold Mines Ltd.	6 diamond drill holes totalling 4,496.5 m (14,753 feet).
1954-1957	Roche Long Lac Gold Mines Ltd	5 diamond drill holes totalling 3,246.9 m (10,653 feet).

The foregoing holes were targeted on the south-easterly extension of the main uranium-bearing zone on the north limb of the Quirke Lake Syncline. The area of drilling was centred only three kilometres ESE of the Can-Met Mine and four kilometres east of the Stanrock Mine.

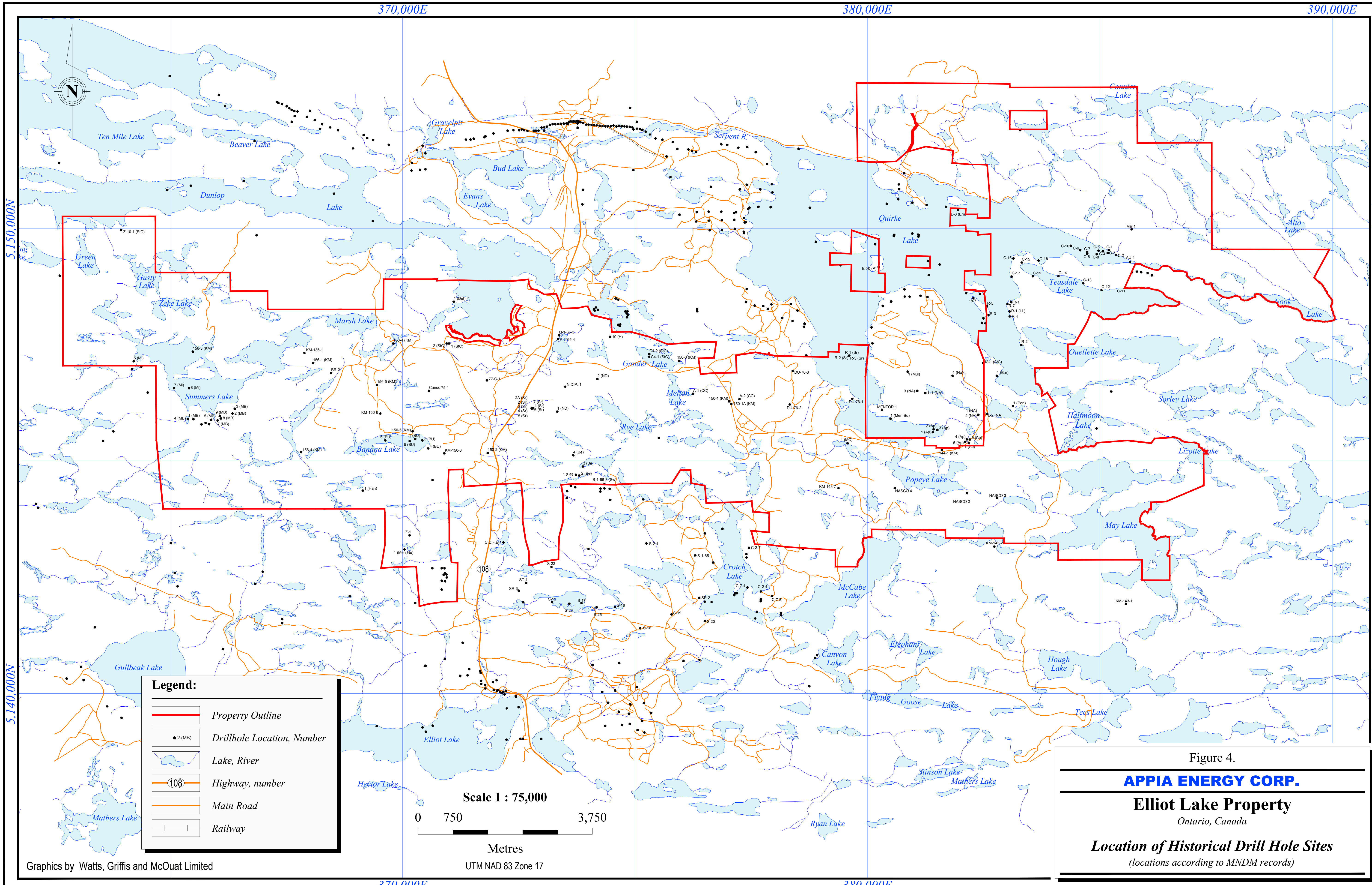
The Conecho Mines Ltd. ("**Conecho**") drilling program was evidently designed to test along strike of the Panel Mine in an area where the uranium-bearing Matinenda Fm. occurs at a relatively shallow depth. All of the holes were drilled vertically. Four of the holes reviewed by WGM produced interesting intersections:

C-4	48.8 – 52.1 m (160.0-171.0 ft)	3.3 m (11 feet)	0.4 lbs U_3O_8/ton	(0.020% U_3O_8)
C-6	59.0 – 59.4 (193.6-194.9)	0.4 m (1.3)	0.68 lbs U_3O_8/ton	(0.034% U_3O_8)
C-10	241.5- 244.4 (792.3-801.7)	2.9 m (9.4)	0.2 lbs U_3O_8/ton	(0.010% U_3O_8)
C-13	312.7-322.6 (1026.0-1058.4)	9.9 m (32.4)	0.54 lbs U_3O_8/ton	(0.027% U_3O_8)

WGM was not able to obtain logs for all of the Conecho drill holes because records for many holes (C9, C10, C12, C14 through C19) do not appear in the MNDM assessment files. Nevertheless, the records for the other holes show that the overlying sequence above the top of the Matinenda ranges in thickness from zero to 234 m (768 feet), with only three holes having more than 37 m (122 feet) of overlying material.

APE REV / APE_06_Historical_DH_Plan.dwg (Layout: 75k)
Last revision date: Tuesday 19 July 2011

Watts, Griffis and McOuat



An undated independent report written by the late Mr. Doug Sprague, P.Eng., formerly Chief Geologist of Rio Algom Ltd., for Artisan Gold Inc. from which Appia acquired the claims, reports that the first 11 holes failed to intersect commercially interesting uranium mineralization. This seems to reflect the fact that the intersections in holes C-4, C-6 and C-10 (reported above) are generally thin and/or low grade. In addition to what is in the assessment files, Sprague reports the following Conecho intersections:

C-12	*interval not available*	1.5 m (5 feet)	1.23 lbs U_3O_8/ton	(0.062% U_3O_8)
C-14	*as above*	1.5 m (5 feet)	1.12 lbs U_3O_8/ton	(0.056% U_3O_8)
C-15	*as above*	1.5 m (5 feet)	1.38 lbs U_3O_8/ton	(0.069% U_3O_8)
C-16	*as above*	1.5 m (5 feet)	1.00 lbs U_3O_8/ton	(0.050% U_3O_8)
C-17	*as above*	1.5 m (5 feet)	1.07 lbs U_3O_8/ton	(0.054% U_3O_8)
C-18	*as above*	1.5 m (5 feet)	0.98 lbs U_3O_8/ton	(0.049% U_3O_8)
C-19	*as above*	1.5 m (5 feet)	1.42 lbs U_3O_8/ton	(0.071% U_3O_8)

The foregoing Conecho drill holes C-12 through C-19 were evidently completed sometime in late 1955 or in 1956. As the host rocks are not steeply dipping in this area, the intersection length in all of the Conecho holes is very close to the true thickness of the mineralized zone, and it very closely matches the actual mining height for room and pillar mining. A compilation map produced by independent mining engineer Robert MacGregor of Sault Ste Marie, and supplied to WGM shows that C-14 and C-15 intersected, respectively, 1.2 lbs U_3O_8/ton over 4.0 feet (1.2 m) and 1.8 lbs U_3O_8/ton over 3.9 feet (1.1 m), effectively confirming the numbers reported by Sprague.

The San Antonio Gold Mines Ltd. ("**SAGM**") drilling program consisted of a single fence of six vertical holes along a north-south section located south of Teasdale Lake, and immediately east of the Appia property. In moving towards the south, the holes progressively encountered an ever thickening assemblage of strata overlying the basal Matinenda conglomerates. Holes SA-1 and SA-6 are sufficiently close to the Appia property to be of interest. Unfortunately, no assays were filed with the San Antonio drill logs. Sprague reported that none of the holes intersected values of interest. It is clear that holes SA-4 and SA-5 were not drilled deep enough to reach the Matinenda Fm. The third hole was drilled into what may be a basement high which stands above the elevation of the Matinenda Fm. The geological information from hole SA-2 is not present in the MNDM file below 3,322 feet (1,012.5 m), and with a total length of 4,215 feet (1,285 m) it is clear that the hole crossed the prospective Matinenda horizons to basement. Strong radioactivity was reported from a pitchblende vein in hole SA-1 at 2022.5 ft (616.5 m), but no assay is reported. The drill core from hole SA-6 between 2,945 and 3,010 feet (897.6-917.4 m), located immediately above the greenstone basement, was removed before the core was logged and no description is available in the public records. This is very unusual and leads immediately to the speculation that the core was well mineralized, despite Mr. Sprague's belief[5], because the hole is clearly on the trend of mineralization from the Panel Mine.

The Roche Long Lac Gold Mines ("**Roche**") holes were completed on the islands and near the main shoreline of Quirke Lake, approximately 4 km from the Panel Mine and as little as 1.5 km from the Can-Met shaft. Of the seven holes drilled, the MNDM records contain the logs and assays for five. Of these, three holes reported intersections ranging between 2 m and 9.5 m grading between 1.1 and 1.8 lbs U_3O_8 per ton as follows:

R-1	556.4 – 557.0 m (1825.3 – 1827.3 ft)	0.6 m (2.0 feet)	1.1 lbs U_3O_8/ton	(0.055% U_3O_8)
	560.3 – 561.7 m (1838.4 – 1842.9 ft)	1.4 m (4.5 feet)	1.14 lbs U_3O_8/ton	(0.057% U_3O_8)
	652.4 – 563.3 m (1845.0 – 1848.2 ft)	0.9 m (3.2 feet)	0.94 lbs U_3O_8/ton	(0.047% U_3O_8)
R-3	626.9 – 628.4 (2056.8 – 2061.8 ft)	1.5 m (5.0)	1.8 lbs U_3O_8/ton	(0.90% U_3O_8)
R-5	576.7 – 579.6 (1892.0 – 1901.5 ft)	2.9 m (9.5)	1.5 lbs U_3O_8/ton	(0.075% U_3O_8)

Hole number R-4 showed anomalous radioactivity in the interval 611.1-614.8 m (2,005-2,017 ft) but only very low uranium values of 0.01-0.02% U_3O_8 (0.2-0.4 lbs/ton) were reported. Similarly, Roche drill hole R-2 showed anomalous radioactivity at 733.0-742.5 m (2,405-2,436 ft) in the hole, but the samples did now show significant uranium assays.

Mr. Sprague completed a resource estimate which is of an uncertain date, but which WGM believes must be treated as historical and non-compliant with current CIM standards and guidelines. It is based solely on the drilling carried out during the 1950s, and is based in part on Mr. Sprague's experience gained when he was Chief Geologist, Rio Algom Ltd. during the period 1960-1990. Mr. Sprague notes "the calculations were done in the same manner that was used when the mines were in production, in fact, some of the uranium resources were calculated by the Panel Mine staff at the mine's closure as a mine-indicated resource".

5 Mr. Sprague notes the 65 ft section was in the Lower Mississagi Fm., however he does not describe the rock type encountered, nor does he say whether quartz-pebble conglomerates were present.

Several of the holes, notably C-20 and C-16, were drilled 250-500 m (800-1,600 feet) from Panel Mine underground workings. A polygonal approach was used whereby each drill hole intersection was applied to the grade and thickness (tonnage) of each resource block. The "mine-indicated" resource blocks are all adjacent to existing Panel Mine workings. Lower confidence "drill-indicated" blocks, are square blocks measuring 800 feet by 800 feet (244 m square) centred on drill hole intersections. Possible blocks having the lowest confidence are those areas that occur between the other blocks. The historical, non-compliant resources reported by Mr. Sprague were quantified as follows in Table 5.

Table 5
Historical Non-Compliant Resources of the Teasdale Lake Zone

Resource Class	Quantity (tons)	Grade (lbs U_3O_8/ton)	Contained U_3O_8 (lbs)
Mine Indicated	1,274,600	1.316	1,676,800
Drill Indicated	5,302,000	1.274	6,756,700
Subtotal	6,576,600	1.295	8,433,500
Possible	10,881,600	1.135	12,353,700
Total	17,458,200	1.206	20,787,200

Note: The foregoing resources are of a historical nature – they should not be relied upon for investment decisions as the estimates are not compliant CIM Standards and Guidelines for the estimation of Mineral Resources and Mineral Reserves and are therefore not compliant with current National Instrument 43-101 requirements. Neither Appia nor its Qualified Persons have done sufficient work to classify the historical resources as current mineral resources under current mineral resource terminology and are not treating the historical resources as current mineral resources

5.3.3 Gemico Block #3

Gemico Block #3 was defined by Rio Algom Ltd. within the boundaries of a group of claims that it acquired from Gemico during the late 1970s. The block is illustrated on a map drafted by Rio Algom Ltd. (1979) and provided to WGM by the MNDM in Sault Ste Marie. The map bears the title "Gemico Properties, Elliot Lake Area" and is referenced as drawing #791.

The down-dip location of the uranium-bearing conglomerates is shown on the map. WGM believes that this outline is based on mine geology and evidence from diamond drill holes. A stippled area represents that portion of the uranium-bearing zone which is located under the Gemico claims. Within this area, Rio Algom has estimated that a "potential resource" of some 42.8 million tons of mineralization exists having an average tenor of 0.38 lbs U_3O_8 per ton over an average thickness of 28.5 feet. This estimate is apparently based on a single drill hole, KM-144-1, put down by Kerr McGee near the north-western boundary of the claims. The hole intersected a zone having this grade and thickness. According to the original drill log that WGM obtained from the MNDM assessment files, the mineralized zone contains a higher grading interval at 1,118.0-1,121.4 m (3,668-3679 ft) averaging 0.46 lbs U_3O_8 per ton over a thickness of 3.4 m (11 ft). The volume of the mineralized zone is confined to the Gemico claims and is truncated by the inferred margin of the mineralized zone. It is clear that uranium mineralization extends to the east, north and west of the Gemico claims. The truncation of the mineralization to the south is not justified as two holes, Nasco #2 and Nasco #3 intersected mineralization of interest approximately 500-800 m south of the Gemico claims. Nasco #2 intersected 0.8 lbs U_3O_8 per ton over a thickness of 1.5 m (5 ft), the grade being an average of the initial intersection (0.76 lbs U_3O_8/ton over 1.5 m) and a second wedged cut (0.84 lbs U_3O_8/ton over 1.5 m). Nasco #3 intersected 0.5 lbs U_3O_8 per ton over a thickness of 4.5 m (14.9 ft).

Given Rio Algom's experience as one of the two main uranium producers, and based on the foregoing evidence, WGM accepts the above-mentioned historical estimate as a reasonable estimate of the exploration target within the Gemico #3 block which shows that a higher grading core zone is present, likely grading 0.5-0.8 lbs U_3O_8 per ton, that could positively influence the viability of mining this zone. The potential quantity and grade is conceptual in nature, there has been insufficient exploration to define a mineral resource and it is uncertain if further exploration will result in the target being delineated as a mineral resource. As the area held by Appia also covers the area surrounding the Gemico block, we conclude that the mineral potential on the Appia claims is probably greater than that estimated for the block alone, and that additional drilling is justified to increase the resource base.

5.3.4 Gemico Block #10

Rio Algom estimated that the uranium-bearing conglomerates underlying the Gemico #10 block contained a "potential resource" of 20.7 M tons with an average grade of 0.75 lbs U_3O_8 per ton with an average thickness of 3 m (10 ft). This historical estimate, which does not comply with current NI 43-101 requirements, was based on Kerr McGee drill hole KM-150-1 (1.6 lbs U_3O_8 per ton over 1.5 m [5 ft]), drilled in the north-western area of the zone, as well as two drill hole intersections on the Denison block completed by Denison Mines Ltd and Uranez Mitsui:

DU-76-2 0.62 lbs U_3O_8 per ton over 2.1 m (6.9 ft).
DU-76-3 0.65 lbs U_3O_8 per ton over 3.8 m (12.4 ft).

Like the Gemico #3, the mineral potential of the #10 block is constrained by the geographical boundaries of the claims available to Rio Algom as shown on the above-mentioned Rio Algom map. It is significant that a large block of ground to the north, previously owned by

Denison Mines Ltd., is located immediately down-dip of the Stanrock and Spanish American Mines. This block is now part of the claim group held by Appia. The historical resource estimated for the #10 block was further constrained by the limits of the zone thought to be of ore grade at the time of the estimate. According to Sprague (date?), the western margin of this mineralized zone is delimited by the Ramsey Lake Scour, within which the middle Mississagi boulder conglomerate was deposited in a channel eroded downwards through the uranium-bearing Matinenda quartz-pebble conglomerates. This feature is well illustrated on Figure 4 which is from Rupert (1980).

Sprague confirms the intersection in Kerr McGee drill hole 150-1, but refers to an intersection in hole DU-76-2 of 0.40 lbs U_3O_8 per ton over 46.1 feet (14.1 m). This clearly exceeds the intersection reported from other sources, although the two are not mutually exclusive. The sample data were not available to WGM however MacEachern rightly asserts that this represents the entire Denison main zone reefs of the Quirke Ore Zone. The narrower intersection of 0.62 lbs U_3O_8 per ton over 2.1 m (6.9 ft) is the lower reef only.

WGM successfully located the intact casing for hole KM-150-1 in the field and surveyed its location by GPS. WGM's review of the Kerr McGee hole from the original log taken from MNDM assessment files shows that the zone in hole 150-1 can be widened somewhat to take in the lower grading shoulders and thereby give a mineralized width of 2.6 m (8.5 ft) grading 1.1 lbs U_3O_8 per ton.

Hole DU-76-1, collared near Quirke Lake, immediately down dip of the Stanrock Mine, and less than one kilometre east of the Gemico block also produced an interesting intersection of 0.72 lbs U_3O_8 per ton over 4.7 m (15.4 ft).

For the same reasons as cited in respect to the Gemico #3 block, WGM accepts the foregoing historical estimate as a reasonable expression of the magnitude of the exploration target in the Gemico #10 block. The potential quantity and grade is conceptual in nature, there has been insufficient exploration to define a mineral resource and it is uncertain if further exploration will result in the target being delineated as a mineral resource. As the area held by Appia also covers the area surrounding the Gemico block, we conclude that the exploration potential on the Appia claims is probably greater than that estimated for the block alone, and that additional drilling is justified to increase the resource base.

5.3.5 Banana Lake Zone

The area west, north and east of Banana Lake was included in the Gemico #2 claim block. This area has been well tested by deep diamond drill holes, most of which was completed by Kerr McGee Corp. The area north of Banana Lake was also drilled much earlier during 1955-56 by Buffalo Uranium, however the four holes completed totalled only 1,227.1 m (4,026 ft), none being greater than 343.5 m (1,127 ft) in length, and none was sufficiently deep to reach the uranium-bearing Matinenda Fm.

Based on the drilling completed, Rio Algom estimated a historical, non-compliant resource for that part of the uranium-bearing Matinenda located below the Gemico #2 claim block. As with above-mentioned estimates for the Gemico #3 and #10 blocks, the estimate for this area is constrained by the geological limits of the mineralized trend which may extend from the Stanleigh Mine to the southeast. It is also constrained by the physical limits of the claim blocks available to Rio Algom. For example, the uranium-bearing conglomerates clearly extend to the east onto a large claim block formerly controlled by Denison, however this resource area was not included in the Rio Algom estimate. According to MacEachern, Denison did not complete its own forward-looking estimate of the uranium resources on its own claims. The Rio Algom historical resource estimate is also constrained by drill holes that returned trace values for uranium or failed to intersect the Matinenda conglomerates at the anticipated depths, for example in drill holes KM-149-2, KM-156-4 and KM-150-4.

Rio Algom estimated that the Gemico #2 block claims contained a potential uranium resource of 175.8 M tons of U3O8 with an average grade of 0.76 lbs U3O8 per ton, and with an average thickness of approximately 5.4 m (17.6 ft). These historical estimates of grade and tonnage are viewed as reliable and relevant based on the information and methods used at the time. However they are not compliant with resource definitions under NI 43-101 and must be considered only as historical resources. Neither Appia nor its Qualified Persons have done sufficient work to classify the historical resource as a current mineral resource under current mineral resource terminology and are not treating the historical resource as a current mineral resource. The historical resource should not be relied upon. This historical resource estimate was based on a collection of the company's widely spaced drill holes which are summarized as follows:

KM-156-5	0.65 lbs U_3O_8 per ton over 10.4 m (34 ft)
KM-150-5	0.88 lbs U_3O_8 per ton over 13.4 m (44 ft)
KM-150-2	0.68 lbs U_3O_8 per ton over 3.4 m (11 ft)

WGM successfully located the collar and casing for the KM-150-2 drill hole, and surveyed its position by GPS to within an estimated position error of less than 3 m. As this was purely a test of WGM's ability to locate a hole using the historical records as a guide, WGM did not attempt to locate the other holes *(subsequently located by Appia)*.

WGM's review of the assessment record filed for Kerr McGee hole 156-5 showed that the record contains only 61 m (200 feet) of geology ending in the Gowganda Fm. Given the placement of the hole, it is not reasonable to conclude that the hole was intended to be a 61 m hole. No mention of hole abandonment is contained in the public record. WGM is of the opinion that the depth reported on the Rio Algom map (1,554 m or 5,099 ft) is correct and that Kerr McGee filed only that amount of the hole that was needed to maintain the claim(s) in good standing, a common practice at the time. WGM has also of the opinion that the uranium intersection reported on the Rio Algom map was also correct *(subsequently confirmed by Appia's drilling in 2007-08)*.

WGM's review of Kerr McGee hole 150-5 showed that the hole was drilled to 1,497.5 m (4,913 ft) a depth sufficient to ensure that the hole intersected the Matinenda Fm. at approximately 1,433 m (4,700 ft). However, the geology and assay results for the section below 1,346 m (4,416 ft) were selectively removed from the drill hole record filed with the Ministry. What is now available through the MNDM ERMES database (MDI Reference #41J07NE0052) lacks the geological record below 1,346 m (4,416 ft) and lacks sample data. The graphic log for the hole below 1,347.2 m (4,420 ft) has been hidden by a piece of blank paper put in place at the time the log was photocopied. Given the timeframe, Kerr McGee's failure to file complete drill hole records for assessment purposes is not surprising. WGM believes this critical information was withheld because of the higher grade and thicker nature of the uranium intersection. Hole NDM #2, drilled in the southwest corner of the Canuc Property, and filed by New Delhi Mines Ltd. in 1957 had a key section at 1,457-1,581 feet (444.1-481.9 m) in the lower Mississagi Quartzite (Matinenda Fm), only 21 feet (6.4 m) above the bottom of the hole, blacked out by felt pen to protect information WGM assumes the company considered to be proprietary (AFRI Reference # 41J07NE0061). In hindsight, it is regretful that the Mining Recorder accepted such submissions at the time [6].

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[6] At the time the drilling was completed, the Ontario Mining Recorder awarded annual assessment credits for work completed. Each claims was required to have a specific number of days of work completed per year. Diamond drilling produced credits of one day per foot drilled, but no additional credits were awarded if the drill log contained assay results. For this reason, companies commonly filed the hanging wall geology which accounted for most of the hole length, and omitted the mineralized zone, or if the zone was included, withheld the assay data.

The foregoing historical Banana Lake resources represent an approximate exploration target that is confined not only by Gemico claim boundaries, but also by drill holes completed by Kerr McGee to the south (149-2 and 156-4) and to the north (150-4) which failed to intersect the Matinenda conglomerates. The potential quantity and grade is conceptual in nature. There has been insufficient exploration to define a mineral resource and it is uncertain if further exploration will result in the target being delineated as a mineral resource. In Beange Twp., a few kilometres to the northwest, hole 156-1 intersected 1.76 lbs U_3O_8 per ton over 0.6 m (2 ft) in an area which is excluded from the foregoing historical resource. This hole suggests additional potential to the west although the economically interesting uranium grades are present in a thin horizon that would not be minable unless greater thicknesses were discovered nearby.

A Canuc Mines Ltd. annual report for 1976 reports the results of three Kerr McGee drill holes completed "immediately west of the present claim holdings of Canuc, which have located a possible extension of the Nordic Zone. These three holes suggest a block of ground which may hold 180,000,000 tons containing a potential reserve of 126,000,000 pounds of uranium oxide". Although the delineation of the "Nordic Zone" requires substantial deep drilling, this reference gives sufficient credence to the Rio Algom historical estimate for WGM to believe that a significant exploration target remains in the area. Based on this estimate, the target might conceptually be in the range of 100-200 million tons grading 0.7-1.4 lbs U_3O_8/ton and containing 70-140 M pounds of uranium oxide. Although Appia's current drilling results in this area are positive, until a comprehensive exploration drilling program is completed it is uncertain whether a NI 43-101 compliant mineral resource of this size will be identified.

Given Rio Algom's experience developing mines at Elliot Lake, WGM is prepared to accept the broad brushed historical approach to defining resources in the Elliot Lake area, especially given the stratiform character of the deposits. This approach was successfully used by both Rio Algom and Denison to plan new mines and in developing new ore zones. However, the foregoing historical resource block underlies an area totalling approximately 6.2 km^2 (2.4 mi^2) and is based on only four holes, with an additional three holes constraining the zone. Although the geological basis for the estimate appears to be reasonable, too little hard evidence is available in this area to associate the resources identified by Rio Algom with any current NI 43-101 compliant resource classification. WGM accepts the abovementioned estimate as a reasonable estimate of the magnitude of the <u>potential</u> exploration target in this area. WGM believes that the thicknesses reported offer underground bulk mining possibilities that could greatly reduce mining costs. Clearly, additional drilling is required to bring these historical resources into NI 43-101 compliance. It must also be stressed that the area held by Appia covers prospective areas that were not on the original claims held by Gemico, and therefore we consider the foregoing statement of potential to be a minimum reflection of the potential of the claims now held by Appia.

5.3.6 Other Zones

In its attempts to corroborate resource information, references were found to drilling carried out by Canuc Mines Limited during 1968 and subsequently on claim blocks 4, 5 and 6. In the company's 1976 annual report, the company states its plans to drill a minimum of three holes to outline mineralization which had been discovered in the northeast corner of Block 5 of its claims. The company had inferred a resource of some 7 million tons grading 1.86 lbs U_3O_8 per ton to exist in this area situated southwest of the Spanish American Mine. The area may have previously been thought to be affected by the Ramsey Lake scour (Figure 6) which removed the lower uranium-bearing horizons of the Matinenda Formation. Apparently follow-up holes intersected lower, but still interesting grades of 0.63 lbs U_3O_8 per ton over a thickness of 1.4 m (4.6 feet) in drill hole 77-C-1 located on Block 4 (Figure 4 location uncertain). Mr. Len Cunningham, P.Eng., an independent consulting engineer and resident of Kirkland Lake reviewed the results and recommended additional drilling (Canuc Annual Report, December 1977).

Although WGM was unable to determine how the aforementioned historical resources were estimated, and it was unable to locate a log for hole 77-C-1, it does appears certain that economically interesting uranium grades and some uncertain tonnage exists on the former Canuc claims. WGM believes that the foregoing historical resource, which does not comply with current estimation guidelines and standards as contained in NI 43-101, must be treated as an approximation of the size of the exploration target in this area.

5.3.7 Summary of Uranium Resources

The historical resources in the foregoing zones is summarized as follows in Table 6.

Table 6
Historical Non-Compliant Resources on the Appia Elliot Lake Property

Zone	Quantity (tons)	Grade (lbs U_3O_8/ton)	Contained U_3O_8 (lbs)
Teasdale Lake	17,458,200	1.206	20,787,200
Gemico Block #3	42,800,000	0.38	16,264,000
Gemico Block #10	20,700,000	0.75	15,525,000
Banana Lake Zone	175,800,000	0.76	133,608,000
Canuc Zone	7,000,000	1.86	13,020,000
Total	263,758,200	0.76	199,204,200

The historical estimates of grade and tonnage set out above are viewed as reliable and relevant based on the information and methods used at the time. However they are not compliant with resource definitions under NI 43-101 and must be considered only as historical resources. Neither Appia nor its Qualified Persons have done sufficient work to classify the historical resources as current mineral resources under current mineral resource terminology and are not treating the historical resources as current mineral resources. The historical resources should not be relied upon.

The foregoing historical resources summarized in Table 6 were estimated by mine operators using practices that were common at the time, but which do not comply with current regulatory standards and guidelines. It is doubtful that quality control standards used at the time would meet more rigorous requirements in practice today. Specifically, the operators relied on experience and assumptions of continuity rather than factual drill hole geology and assay data. As such, these estimates do not comply with NI 43-101 and should not be used for investment decisions.

It is worth noting that WGM could find no mention of historically estimated rare earth metal resources, a reflection of the fact that such metals were affected by weak markets during the peak uranium production period, and that yttrium-REE production was incidental to uranium. As a result, drill core was not routinely assayed for such metals.

APE REP / APE_04_Prop_Geol.dwg (Layout: 75k)
Last revision date: Wednesday 19 July 2011

Watts, Griffis and McOuat

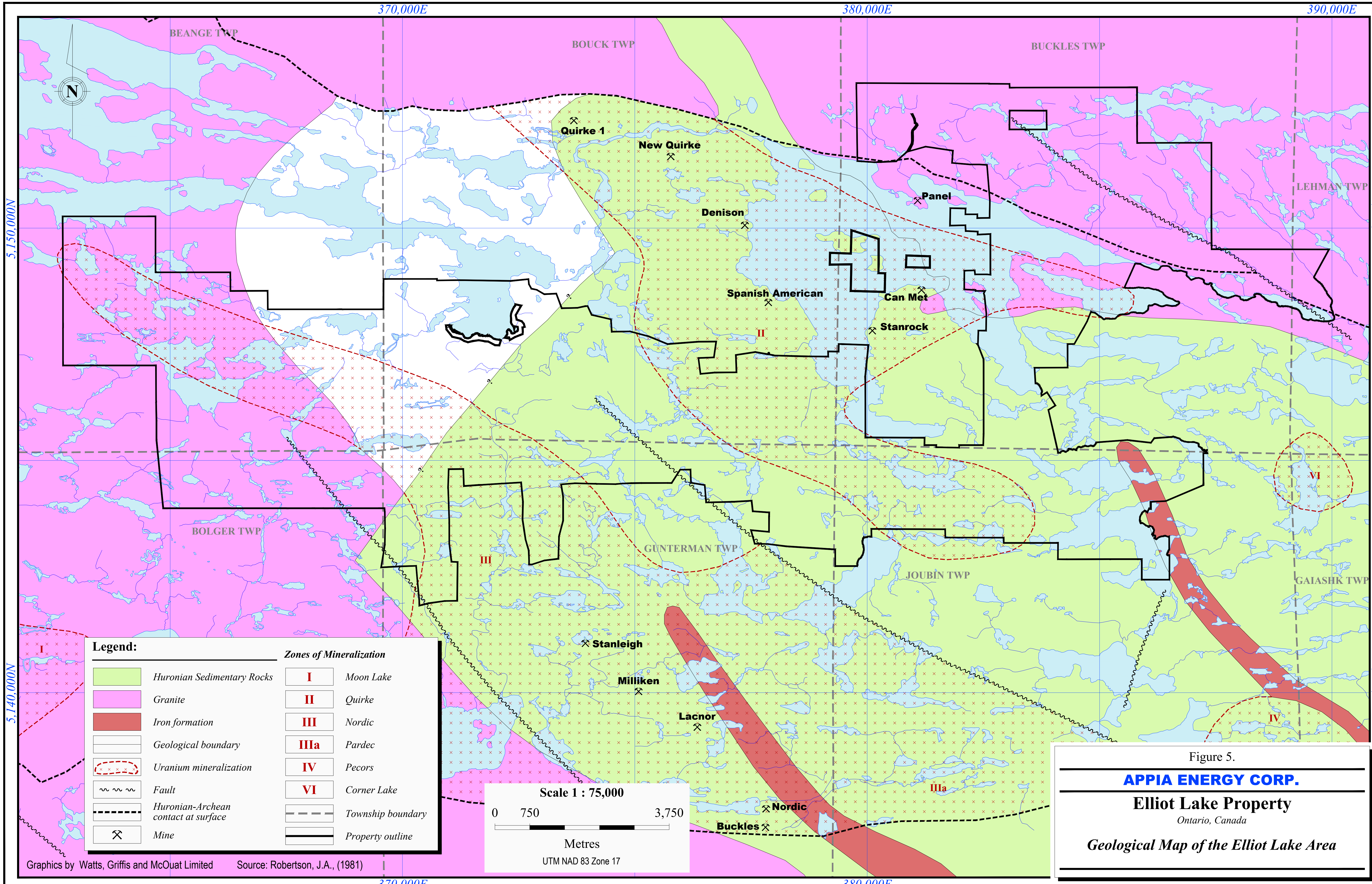

Figure 5.

APPIA ENERGY CORP.

Elliot Lake Property

Ontario, Canada

Geological Map of the Elliot Lake Area

6. GEOLOGICAL SETTING

6.1 REGIONAL GEOLOGY

The Elliot Lake area is located on the southern margin of the Archean component of the Superior Province of the Canadian Shield (Figure 5). As is typical across North America, the margin is marked by a series of structural basins and troughs which contain late Archean to early Proterozoic sedimentary rocks. These rock formations are important in that they host significant iron formation deposits as well as most of the known occurrences of uraniferous quartz-pebble conglomerate. Although the deposits are diverse, and differ in age by as much as several hundred million years, they share many sedimentary and structural characteristics. The sedimentary sequences laid down on the shield margins record several transgressive cycles each resulting in deposition of fluvial-to-marine or glacial-to-marine conglomerates and sandstones, followed by shallow-marine clastic or carbonate rocks (International Atomic Energy Agency, 1987). Generally the final cycle of sedimentation ends with deep-water-marine dark shales, greywacke and volcanic rocks. Episodes of extension, compression, intrusive magmatism and metamorphism occurred during the same approximate period of time. The range of lithologies in the Elliot Lake area is shown in Plates 2, 3, 4 and 5.

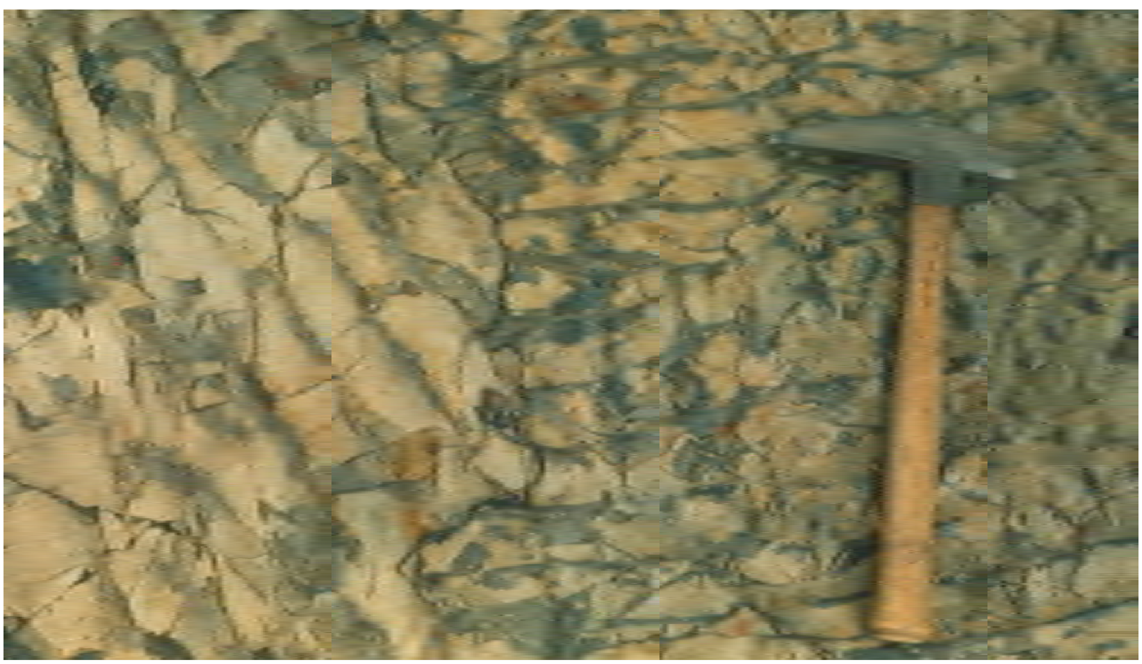

Plate 2: Ripple marked Lorrain Formation siltstone in the Elliott Lake area.

Plate 3: Well stratified Gowganda Formation conglomerate in the Elliot Lake area.

Plate 4: Well laminated Espanola Formation dolomitic limestone.

Plate 5: Ramsey Formation – Granitic drop-stone in varved sediments – evidence of ice-rafted boulders.

The structural basins or troughs that contain uranium-bearing conglomerate formed within or on the Archean continental crust, and apparently near its margin, however the southern limit of the Archean has not been precisely located because Paleozoic, and younger sedimentary rocks cover most of the area south of the early Proterozoic basins.

The Lake Huron region, within which Elliot Lake is located, contains the early Proterozoic Huronian Supergroup, of which the basal deposits in the Elliot Lake district contain the world's most important deposits of uranium in Precambrian conglomerate.

The Huronian Supergroup is a southward-thickening, mainly clastic succession with is well exposed north of Lake Huron (Figure 4). It forms as east-west trending belt overlying the southern portion of the Superior Province of the Canadian Shield. The rock succession is divisible into three megacycles, each composed of coarse-grained fluvial sandstones overlain by glacio-marine/lacustrine mixtites and marine/lacustrine siltstone plus shale with a capping deltaic succession which is overlain by coarse sediments laid down during the next transgressive cycle. Prograding deltas and abandoned channels combined with nonsynchronous southeast to northwest flooding to add a large diachronous element to lithofacies boundaries.

Each megacycle can be sub-divided into a three-part succession beginning with the development of a glacial outwash plain, followed by isostatic depression and flooding as the ice sheet advanced into the area and then an interval of glacio-marine deposition with development of a fine-grained marine/lacustrine succession as glacial melting raised the water level, and finally delta progradation as isostatic rebound began to outstrip the rising water.

The ore-bearing conglomerate beds in the district are found in the Matinenda Formation, the basal unit of the Elliot Lake Group within the Huronian Supergroup. The uranium-bearing conglomerate is a clean, well sorted, coarse-pebble conglomerate which was apparently deposited in a mixed littoral and fluvial-deltaic fan environment, possibly as the early Proterozoic sea transgressed up onto the Archean craton. The conglomerate is overlain by and interfingers in a time-transgressive relationship with the shallow-marine McKim Formation.

The Elliot Lake Group is successively overlain by the Hough Lake, the Quirke Lake, and the Cobalt Groups, each of which begins with basal paraconglomerates which show evidence of being deposited in a glacial or glacio-marine environment. Each of the paraconglomeratic formations is succeeded by shallow-marine clastic or carbonate rocks. The entire succession, as well as most individual formations, thickens to the southeast and feathers out onto the Archean craton to the north.

Pyrite is the main iron mineral found in the Matinenda Formation, whereas superseding formations contain predominantly hematite. The Th-U ratio in radioactive placer deposits first increases to greater than ten in the Lorrain Formation. This is thought to present strong evidence that during the early Proterozoic deposition of the Huronian Supergroup, a profound change in the Earth's atmosphere resulted in a transition from non-oxidizing to oxidizing conditions. Neither the uranium in the quartz-pebble conglomerates nor the iron formation deposits found elsewhere on the edge of the Archean craton would have been stable had the earth’s atmosphere not been anoxic at the time of deposition.

This prevailing view concerning the atmosphere is clouded somewhat by Robinson and Spooner (1984) who argue that episodic post-depositional modification of the uraniferous conglomerates leached iron from detrital ilmeno-magnetite grains, caused some uraninite to be replaced by coffinite ([U,Th]SiO_4) and resulted in the dissolution and alteration of monazite to uranothorite ([Th,U]SiO_4). Brannerite was also a product of the reaction of U and TiO_2. Further alteration resulted in the precipitation of secondary pyrite under conditions of low to moderate Eh and slightly acid pH for ilmeno-magnetite leaching, and low Eh and near-neutral pH for pyrite precipitation. Under such conditions uraninite and coffinite are relatively stable. The authors conclude that the simple presence and preservation of detrital uraninite cannot be used to draw conclusions about the oxygen content of the late Archean atmosphere at approximately 2,350 Ma.

Mafic volcanic rocks underlying or interbedded with the lowest beds of the Matinenda are most abundant in the vicinity of two east-trending fault zones (the Murray and Flack faults), which also mark zones of abrupt change in style of sedimentation and the thickness of stratigraphic units. These basin-bounding faults apparently acted as hinge lines that were zones of crustal bending, faulting, and minor volcanism during deposition of the Huronian strata.

The Huronian Supergroup lies unconformably upon Algoman granitic rocks which have been dated at about 2,500 Ma. They are intruded by a series of post-Huronian rocks, the oldest of which is the Nipissing Diabase, dated at about 2,100 Ma.

6.2 GEOLOGY OF THE ELLIOT LAKE AREA

The Elliot Lake area is underlain by an approximately east-west trending basin within which the Huronian sedimentary strata on-lap the Archean basement to the north, and presumably also to the south. Uranium mineralization occurs in the predominantly quartzose and arkosic rocks of the Matinenda Formation, located near the base of the Huronian sequence and unconformably overlying the Archean basement. The stratigraphic nomenclature for the Elliot Lake area is shown in Table 7.

The Huronian succession is folded into an east-west trending syncline, the Quirke Lake Syncline, which is located immediately north of the city of Elliot Lake. Uranium-bearing Matinenda Formation strata are exposed on the limbs of the fold, but occur at vertical depths of +/- 1,500 m (5,000 ft) near the centre axis of the basin. Uranium mines are located on both limbs and the Quirke Lake structure has been well tested an explored by underground mine developments as well as deep exploration drilling. The Can-Met, Denison, Panel, Quirke, New Quirke, Stanrock and Spanish American mines are located on the north limb whereas the Buckles, Milliken, Lacnor, Nordic and Stanleigh mines are situated on the south limb.

During the mid-1980s, more than half of Canada's reasonably assured uranium resources, though expensive to develop and mine, were contained in the Quirke Lake Syncline despite the addition of high-grade deposits found in the Athabasca Basin of northern Saskatchewan (International Atomic Energy Agency, 1987).

The Matinenda Formation is the coarse-grained sandstone unit at the base of the stratigraphically lowest megacycle. To the north, it on-laps over an irregular Archean basement surface, filling paleo-valleys and draping over intervening hills. Uranium-bearing quartz-pebble conglomerates (Plate 6) occur within the sandstones in the lower part of the Matinenda Formation, forming laterally extensive deposits with NW-trending long axes. In a general sense, the NW end of the conglomerates either abuts against basement or is cut of by an erosive scour at the base of the overlying Ramsay Lake Formation. The conglomerates die out to the southeast by an increase in the proportion of interbedded sandstone wedges and a general reduction in grain size.

The uranium-bearing portion of the Matinenda is divided into three members. From uppermost downwards, these are the Manfred Member, the Stinson Member and the Ryan Member. The presence and thickness of these members and their uranium-bearing zones is dependent on the relative elevation of the Archean unconformity and the topography of its surface.

Two principal ore zones are present: the Quirke Ore Zone on the north limb of the basin (the Quirke Lake Syncline), and the Nordic Ore Zone on the south limb. The Quirke Ore Zone occurs in the Manfred Member of the Matinenda Formation. The Nordic Ore Zone occurs in the Ryan Member. It is important to note that there is no Ryan Member on the north limb and the Manfred Member is absent on the south limb.

Table 7
Nomenclature for Huronian Stratigraphy in the Blind River Area

Age	Group	Formation	Lithology	Thickness	Depositional Environment	Source	Mineralization
Proterozoic	Cobalt	Bar River	quartzite	>300 m at Flack Lake; >1,212 m at Willisville	shallow water	variable currents from north	
		Gordon Lake	siltstone, sandstone	300 m at Flack Lake; 1,212 m at Willisville	shallow water		
		Lorrain	quartzite, conglomerate, arkose	606-1,820 m	shallow water	north-northwest	thorium-uranium in north
		Gowganda	conglomerate, greywacke, quartzite, siltstone	152 – 1,280 m	glacial in north; glacial-marine in south	north	
							unconformity
	Quirke Lake	Serpent	quartzite	0 – 335 m	shallow water	northwest	
		Espanola	limestone, dolostones, siltstone	0 – 457 m	shallow water	northwest	traces of uranium in Victoria Twp.
		Bruce	conglomerate	0 – 61 m	glacial - shallow water	north?	
	Hough Lake	Mississagi	quartzite	0 – 914+ m	shallow water	west-northwest in west; north in southeast	uranium near basement highs
		Pecors	argillite	12 – 305+ m	shallow water	north-northwest	traces of uranium near basement highs
		Ramsay Lake	conglomerate	1.5 – 61 m	glacial - shallow water	northwest?	traces of U where unconformable on Matinenda Fm.
	Elliot Lake	McKim	argillite-greywacke	0 – 762 m	shallow water (turbidite)	northwest	traces of uranium near basement highs
		Matinenda	quartzite, arkose, conglomerate	0 – 213+ m	shallow water	northwest	uranium-thorium-rare earths in conglomerates in basement lows
				unconformity			
Archean			andesite, basalt, felsic volcanic rocks		subaerial	Flack Lake, Murray Lake	Uranium-thorium in conglomerate interbeds

Nomenclature after Robertson et al, 1969

Plate 6: Typical Elliot Lake ore from the Matinenda Formation – compact, well indurated quartz-pebble conglomerate with detrital pyrite and interstitial uranium minerals – 3 cm hammer scale.

The Stinson Member of the Matinenda Formation lacks uranium in economically interesting concentrations. The base of the Stinson in some areas of the Nordic Ore Zone is marked by angular, grey granite-clast conglomerate (as compared to quartz pebble clasts in the ore reefs), usually with a matrix of mostly smaller grey granitic material and some, mostly minor, pyrite. This horizon, is usually 2.0-5.5 m thick and is called the Stinson basal conglomerate - it can be very useful as a marker or reference horizon to indicate the top of the Nordic Ore Zone reef hosting Ryan member.

On balance of evidence, a fluvial placer mode of origin is accepted as the most reasonable genetic model for the uranium deposits hosted in the Matinenda Formation. The model is consistent with that for the proposed origin of the gold-uranium paleoplacers in South Africa, but unlike the Witwatersrand, however, the uranium-bearing section at Elliot Lake does not contain intraformational unconformities. The deposits occur as laterally extensive sheets that do not show the evidence of reworking that is apparent in South Africa. Rather, at Elliot Lake the occurrence of large-scale flood events has been proposed as a means of widely depositing detrital uranium. Some idea of the extensive nature of these deposits is provided in Figure 6. The documented presence of glacially derived mixtites associated with Matinenda sediments leads to speculation that catastrophic ice-margin lake drainage flowing down an outwash fan deposited the uraniferous conglomeratic units present in the lower Matinenda Formation.

The following four paragraphs are paraphrased from a draft report being prepared for Appia by Alan MacEachern, former Chief Geologist of Denison Mines Ltd.:

The Quirke Ore Zone is a classic sedimentary delta type of deposit. Quartzose and conglomeratic sediments bearing detrital uranium were introduced through a narrow 1,800 m (6,000 ft.) wide valley in the basement and spread out to the east and southeast to cover an area of approximately 80 square kilometres (30 sq. miles). There is very little Stinson member and no Ryan member between the Manfred member and the basement in the Quirke Ore Zone. Where the Manfred member is thickest, there are two pairs of reefs separated by 36 m (120 feet) of quartzite. The past producing mines of the Quirke Ore Zone were: Denison, Stanrock, CanMet, Quirke (1), New Quirke (2), Panel and Spanish American.

Outside of the mined areas at it's southeast end, much of the Nordic Ore Zone is not well defined by surface diamond drilling. It has been thought to begin approximately 6.5 kilometres (4 miles) northwest of Banana Lake as a 1.5 - 2.5 km (1 - 1.5 mile) wide basement depression channel with relatively steep basement sides (MacEachern, 2009). It extends for approximately 11 km (7 miles) south and southeast of Banana Lake, widening to approximately 13 km (8 miles). There may be some Stinson Member but no Manfred Member overlying the Ryan Member in the Nordic Ore Zone. Where the Ryan Member is thickest there are three reefs in the Nordic Ore Zone. In descending order these are the Pardee, the Nordic and the Lacnor Reefs. The past producing mines of the Nordic Ore Zone were: Stanleigh, Milliken, Lacnor, Nordic and Buckles. Most of the uranium produced was from mining in the Nordic and Lacnor Reefs. Where there is sufficient thickness of the Ryan Member above the Pardee Reef, thin conglomerate or pebble beds called "Floater Reefs" may be present, but to date these occurrences are very thin and do not appear to be economic.

Below the Lacnor Reef, Appia holes BL-07-01, BL-08-02 and BL-08-03 have intersected reefs composed of rounded 8-15cm (3-6 inch) white quartz cobbles (Cobble Reef or Cobble Quartzite), with pale olive green irregular-shaped siltstone clasts and a few black chert clasts. Uranium grades in these rocks appear to be related to the amount of pyrite in the individual beds.

Another zone called the Pardee Zone is located approximately 4.5 km (3 miles) east of the Nordic Mine, east of the southeast corner of the Nordic Ore Zone. The Pardee Zone is approximately 2.5 square kilometres (1 square mile) in size and is separated from the Nordic Ore Zone by a high basement ridge. Pele Mountain Resources has been working on the Pardee Zone since early 2007 and has completed 188 surface diamond drill holes. The company has most recently referred to its deposit as the Eco Ridge Deposit.

The uranium-bearing conglomerates are massively bedded, but do show localized evidence of horizontal stratification. Trough cross-stratification due to meandering deltaic channel development is present in the pebble conglomerates in areas where numerous sandstone lenses occur. Occasionally the cross-sets can be traced from the conglomerate into sandstone lenses. Sandstones interlayered with the conglomerate and forming units separating conglomerate packages are generally trough cross-stratified with cross-set amplitude averaging approximately 12 cm.

Detrital uraninite and brannerite is concentrated in the more massive portions of the longitudinal bars as well as in lags along horizontal reactivation surfaces in stacked bars. The bars themselves represent rare, discrete high energy events in a succession that is dominated by braid-channel deposits (trough cross-stratified sandstones). The gravel bars are localized in the lower portion of the formation, usually being confined to paleovalleys (Roscoe, 1969). U_3O_8 per ton. Although deep, the amount of contained uranium is significant.

The water-borne transport of uranium detritus was from north to south during deposition of the lower portions of the Matinenda. As time passed the regional paleoflow direction gradually changed to NW to SE and eventually to WNW to ESE. The counter-clockwise rotation in paleocurrent direction is thought to reflect crustal subsidence to the east of the area in which the Matinenda Formation was studied.

One interesting aspect of the Matinenda Formation is the presence of pyrobitumen in and near ore-bearing horizons. Stevenson et al (1990) report the occurrence of stratiform and dispersed kerogens in the Matinenda Formation, and concluded that the kerogens formed from mats of cyanobacteria that were affected by diagenetic and low-grade metamorphic processes including partial remobilization.

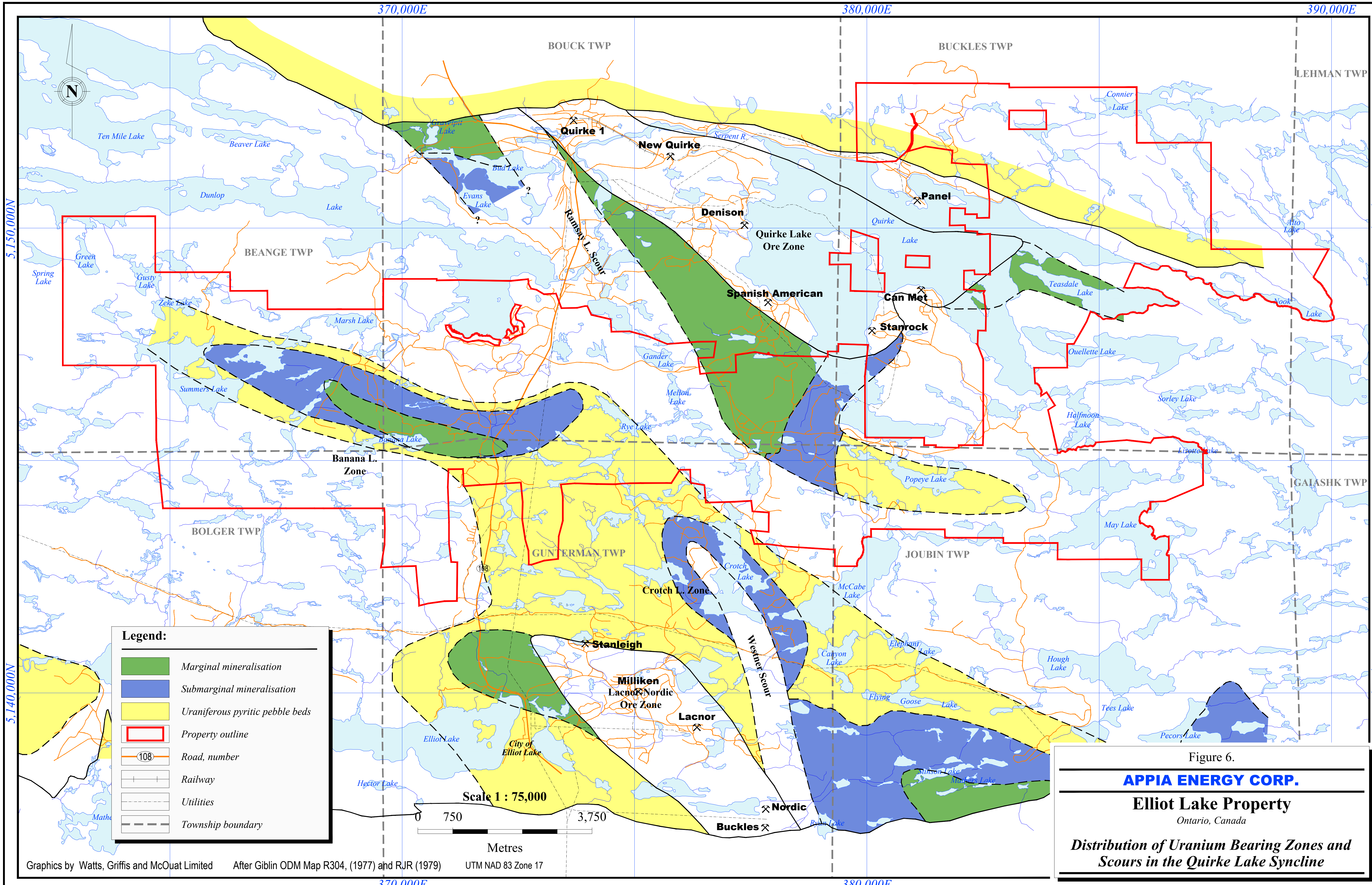

Figure 6.

APPIA ENERGY CORP.

Elliot Lake Property

Ontario, Canada

Distribution of Uranium Bearing Zones and Scours in the Quirke Lake Syncline

During burial and metamorphism, rising temperatures cracked the kerogens to form petroleum, which migrated into fractures and subsequently became pyrobitumen through a combination of water-washing and thermal cracking which converted the oil into a more tarry form. As this tarry material detached from the wall, it formed spheroids that floated upward and were trapped in vuggy openings in the fractures. It is clear to WGM that the presence of kerogens might have contributed to the stabilization of uranium minerals under strongly reducing conditions in the mineralized beds.

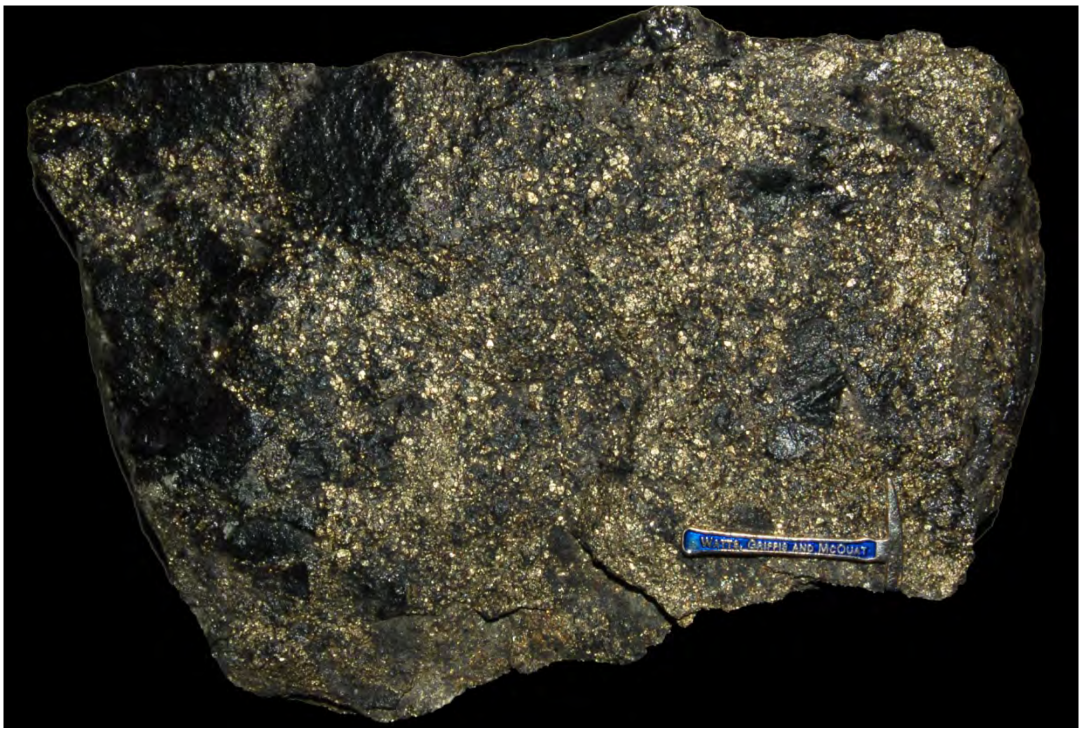

Plate 7: Black quartz-pebble conglomerate commonly referred to as "chlorite ore" - generally thought of as high-grade ore due to significant higher pyrite-brannerite contents – 3 cm hammer scale.

Economically interesting uranium mineralization is not pervasive throughout the basin. Figure 6 shows the distribution of the main uranium-bearing zones of quartz-pebble conglomerate. The favourable horizon is affected by the topography on which the conglomerates were deposited, as well as scours (river channels) which eroded down through the conglomerates following their initial deposition. As is also clear, large areas in the deep basin such as that near Banana Lake, have been shown to contain uranium values exceeding 0.5 lbs per ton. Yttrium-REE minerals have long been known to co-exist with uranium.

7. DEPOSIT TYPES

7.1 GENERAL CLASSIFICATION

The Elliot Lake (and Agnew Lake) deposits are known as paleoplacers and classified by the Geological Survey of Canada as sub-type 1.1.1 (Eckstrand et al, 1995). Uraniferous conglomerates occur in many parts of the world, and are similar to those of other metal commodities, notably gold, platinum group metals, tin, tungsten, rare earth minerals, titanium, zirconium and chromium. The economic minerals are typically deposited in conglomerates at the base of a sedimentary cycle which may, over time, see a gradual transition to lower energy deposition. Although similarities exist between these deposits through the geological timescale, the younger deposits tend to be hematite-rich (subtype 1.1.2) whereas late Archean and early Proterozoic deposits tend to be associated with pyrite. This difference is one factor of many that indicate that the early Earth's atmosphere was anoxic and transitioned to an oxygenated atmosphere somewhat later.

The paleo-placer deposits are stratabound, commonly occurring in stacked sheet-like bodies of conglomerate. Mineralization is entire disseminated and the highest grades are associated with quartz-pebble conglomerates. The pebbles are generally well rounded (Plate 8), and some association between pebble size and uranium grade is noted. Placer deposits are created

Plate 8: Elliot Lake ore - rounded quartz pebbles in U-bearing, sulphide-rich matrix – 3 cm hammer scale.

wherever rapidly flowing water allows heavy mineral particles to settle out while less dense mineral particles and rock fragments are transported through the depositional site. The term paleoplacer is generally reserved for only such mineral concentrations as constitute economically interesting deposits in lithified strata. The erosion of the parent rock and transport of detrital material results in degradation of all but the hardest minerals.

During the 1940s and 1950s, debate centred on whether these deposits were truly syngenetic (placers) or whether they were epigenetic (grown in place) or purely hydrothermal. Davidson (1958) favoured a hydrothermal model which has fallen out of favour, although the potential for recrystallization of uraninite and accretion of additional uranium onto existing mineral grains is still recognized as a possibility. Friedman (1958) points out that Th-enrichment is regional at Elliot Lake, extending well beyond those zones of U-enrichment outlined by exploration drilling. He concluded that the weight of evidence suggests a sedimentary origin for the mineralization because no known hydrothermal process could explain the widespread thorium anomaly. This is supported by Roscoe (1959) of the Geological Survey of Canada who very concisely states "the ore deposits near Blind River represent exceptional, uranium-rich, deposits within an extensive province of thorium-rich clastic sedimentary rocks". The presence of resistate minerals, such as uranium bearing silicates (zircon), is also difficult to explain in an epigenetic model. In the Blind River District, the presence of brannerite (UTi_2O_6) and U-bearing phosphates such as monazite ([Ce,La,Nd,U,Th]PO_4) and xenotime (Y-UPO_4) relates quite well to the weathering of a U-Th and Ti enriched (granitic) source. Brannerite it is believed to have developed as a result of uranium ions adsorbing onto decomposing Ti minerals such as ilmenite.

Most recently, Robinson and Spooner (1984) have underscored the strong evidence for a paleoplacer origin for the U-Th mineralization in the Blind River District. New evidence shows that the regional metamorphic grade is negligible and that the quartz-pebble conglomerates are affected by syn-depositional faulting consistent with a rift margin setting. The authors add that primary uraninite grains were deposited with coarse smoky quartz, perthitic microcline, magnetite with ilmenite lamellae, monazite and zircon, however, the bulk of the pyrite which constitutes 5-10 vol-% of the ore is post-depositional in origin. Pyrite occurs as overgrowths on detrital pyrite grains and on uraninite grains altering to coffinite.

The simple mineralogy of the Elliot Lake ores has been well documented. This simplicity has been used to great advantage in the beneficiation of uranium using both conventional solvent extraction processes as well as in using heap leach and bio-leach technologies.

8. MINERALIZATION

8.1 ORE MINERALOGY

The ore mineralogy consists primarily of detrital grains of brannerite and uraninite, together with minor uranothorite, monazite and secondary coffinite associated with pyrite, pyrrhotite, zircon, rutile and Ti-magnetite as interstitial fill in a quartz pebble conglomerate (Plates 6-8). The pyrite content is typically 10-15% of the rock (Robertson, 1981). As the pebbles are quite competent, only rarely does pyrite occur as fracture fillings.

The main ore mineral is brannerite which occurs as ovoid, reddish-brown grains associated with bladed rutile surrounded by uranium oxides and rare earth oxides. Brannerite generally contains small inclusions of pyrrhotite and radiogenic galena. The second most important ore mineral is uraninite which occurs as black subhedral grains up to 0.1 mm in size. Regionally, the uraninite contains approximately 6% ThO_2 by substitution. This has been noted as an indication that the uraninite originated from a granitic or pegmatitic (magmatic) protolith rather than being of hydrothermal origin. The relative importance of brannerite or uraninite varies from mine to mine. Uraninite is the most important ore mineral in the Nordic Mine and in the C-Reef at the Quirke Mine. Monazite is a lesser ore mineral, however it is important at Elliot Lake as it contains an unusually high uranium content. Monazite occurs as rounded to subangular grains typically less than 0.3 mm in diameter. When the grains are grey in colour, they are strongly radioactive as a result of elevated uranothorite or thorite contents (inclusions). Pyrite is also an inclusion forming phase in monazite. Uranothorite and coffinite have been identified as minor mineral phases in the deposits.

The mines of Elliot Lake are the only deposits in Canada which have seen rare metal production. During the 1970s and 1980s, yttrium was a major by-product of uranium mining at both the Denison and the Rio Algom operations. The Canadian Minerals yearbook documents production Although significant concentrations of rare earth metals were recognized, exceeding even that of yttrium, global prices for such metals at the time did not favour a commercial operation. This report represents an up-date of the previous WGM work to take into account the considerable unrealized value of rare earth metal mineralization present in the Elliot Lake deposits. To the best of WGM's knowledge, no historical resource estimates have ever been made for these metals which have become vital to many current technologies. According to the Canadian Minerals Yearbook for 1980, the yttrium concentrates from the Denison Mine averaged 60% total rare earths of which the relative rare metal contents were 0.8% La_2O_3, 3.7% CeO_2, 1.0% Pr_6O_{11}, 4.1% Nd_2O_3, 4.5% Sm_2O_3, 0.2% Eu_2O_3, 8.5% Gd_2O_3, 1.2% Tb_4O_7, 11.2% Dy_2O_3, 2.6% Ho_2O_3, 5.5% Er_2O_3, 0.9% Tm_2O_3, 4.0% Yb_2O_3, 0.4% Lu_2O_3, and 51.4% Y_2O_3.

Rare earth and yttrium mineralization occurs as coatings on uraninite and brannerite grains and as inclusions within uraninite. Robertson (1976) states that "brannerite is typically found as ovoid red-brown to black grains in the metamict state, showing bladed rutile surrounded by a uranium oxide and rare-earth oxides". The previous mines operated by Stanrock and Denison capitalized on the association by first removing uranium from the pregnant solution, and then precipitating a REE-yttrium sludge that was further leached and reprecipitated to make a mischmetal[7] concentrate. Analytical data shows that REEs in the Elliot Lake ores are primarily represented by Ce, La and Nd.

In contrast to the Elliot Lake mining area, where the deposits were relatively rich in pyrite, brannerite and other uranium minerals such as uraninite and coffinite-uranothorite (after uraninite), the Agnew Lake mining area *(approximately 60 km to the east of the Appia claims)* is distinguished by significantly higher thorium contents, a general lack of uraninite, lower brannerite contents and the prevalence of monazite. These ores also carried variable but relatively minor amounts of base metal sulphides (chalcopyrite, sphalerite, galena) as well as lesser amounts of stibnite, pyrrhotite, arsenopyrite, skutterudite, cubanite, linnaeite, cobaltite, niccolite, pentlandite and related minerals (Davidson, 1957). REE contents were reported to be higher than at Elliot Lake, yet no such production was made from these ores. Researchers attribute differences in mineralization to variances in source areas between the two mining districts. The source area for the mineralization at Agnew Lake is thought to be to the northwest, comprising a sequence of granitic rocks that were particularly enriched in thorium.

The non-metallic gangue minerals in the matrix of the conglomerate are represented by quartz, feldspar and sericite. In some mines a dark grey to black hued ore is reported to contain fine grained chlorite and some of this rock was especially high grade (Plate 9).

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[7] Mischmetal is an alloy of rare earth elements in various naturally occurring proportions. Generally the composition includes approximately 50% cerium and 25% lanthanum with small amounts of neodymium and praseodymium and lesser amounts of the other rare earth metals. Yttrium may be an important component depending on the ore sourced. Differences in solubility of the individual REE's is used in refining each to an oxide or metal state.

Plate 9: Close-up of sulphide surrounding black quartz pebbles in Matinenda conglomerate – the hammer scale is 3 cm in length.

Thucholite, an organo-uranly compound (U-bearing radioactive bitumen), occurs as thin laminae and as a void-filling mineral phase within ore zones at Elliot Lake (Plate 10). The potential for buried organic (hydrocarbon) material to adsorb uranium is well documented. The mineral is post-depositional in origin as it coats and invades grains of uraninite. Its origin is uncertain; a biogenic origin has been proposed, but an alternative concept is that it formed by radiation-induced polymerization of mobile hydrocarbons in pore spaces. Interestingly, this mineral is also found in the uranium deposits of the Witwatersrand, South Africa.

The ores are very well indurated, and some evidence from the mining history suggests that the degree of cementation increases down dip, deeper into the Quirke Lake Syncline. As a result, the ores are highly abrasive when milled and fines tend to act as sand-paper on internal mill surfaces. One added consequence was that aggressive agitation of bioleach solutions resulted in a significant mortality rate for the bacteria suspended in the leach solution.

Plate 10: Black thucholite crystals in void in Matinenda Formation quartzite – 3 cm hammer scale.

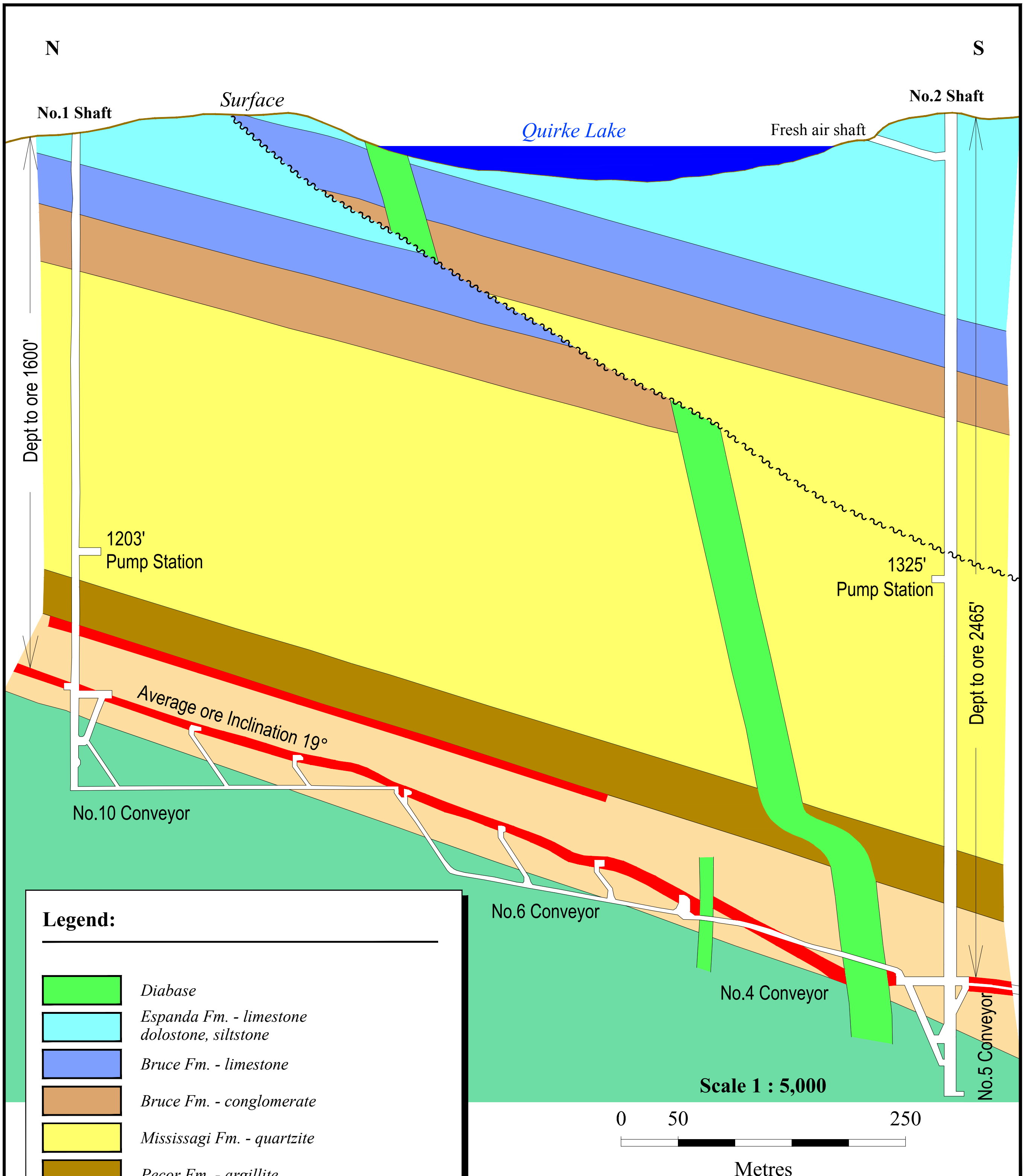
8.2 URANIUM DEPOSITS

The deposits at Elliot Lake are referred to as uranium deposits because of the far greater economic importance of uranium production than that of REEs and thorium. However, in many areas of the mining camp, REEs occur in greater abundance than uranium.

There are few references as to the physical dimensions of the Elliot Lake deposits. They are commonly referred to as stratabound and 3-5 metres in thickness and having "good lateral continuity. Kerr Addison Mine reports on the Agnew Lake Mine give appreciable insights into the size of the deposits from the resource estimation parameters in use at that mine. Only deposits of considerable uniformity and size would permit the use of drill hole spacings of 400 feet (122 m) for the outlining of probable reserves as defined by Kerr Addison's mine engineering department. Given the need for accountability in production planning, one can well appreciate the uniformity of grade that supported the use of such a wide spacing as the standard convention.

Robertson (1981) describes the physical dimensions of the deposits. The largest of the deposits, the Denison Mine, measured 19,500 m long by 1,400 m to 8,000 m wide. The deposit carried an average grade of 2.5 lbs of U_3O_8 per ton of ore. The next largest at Rio Algom's Quirke Mine measured 13,000 m by 1,800-5,500 m wide. The Quirke A Reef at the #1 mine was 3.5 m thick. The Quirke #2 mine's C Reef was 1.8-3.6 m thick and other uranium-bearing horizons were present. A typical geological section through the Denison Mine is shown in Figure 7.

Watts, Griffis and McOuat



Graphics by Watts, Griffis and McOuat Limited Afrer Denison (1967)

Figure 7.

APPIA ENERGY CORP.

Elliot Lake Project

Ontario, Canada

Typical Geological Section Through the Denison Mine

9. CURRENT EXPLORATION

9.1 PRESENT STATUS

Appia contracted Fugro Airborne Surveys of Toronto (Mississauga), Ontario to fly an airborne MegaTem electromagnetic and magnetic survey over the property during 2006. Most recently Appia has completed two programs of diamond core drilling which are summarized in reports by Bernales (2008) and Alan MacEachern (2009).

Between 18 November, 2007 and 12 March, 2008 Appia drill-tested both the Teasdale Lake Zone and the Banana Lake Zone. The drilling was designed by Appia to corroborate some of the previous drill holes in the Teasdale Lake Zone and thereby provide a means to produce a NI 43-101 compliant Mineral Resource estimate for this zone. At Teasdale Lake six holes were drilled for a total of 2,650.2 m (8,695 feet) of drilling (Bernales). On the Banana Lake Zone, Appia drilled four wedged holes from two previous holes put down by Kerr McGee in an effort to corroborate the previous deep intersections. Appia wedged holes from the lower sections of Kerr McGee's historical drill holes KM150-5 and KM156-5, respectively completed in 1969 and 1974, and successfully cut the uranium-bearing Matinenda Formation in four new locations, drilling a total of 1,235 m (4,052 feet). The 2007-08 program resulted in an expenditure of approximately C $2 million.

A second program of diamond drilling was completed by Appia between October and December, 2008 which resulted in the drilling of two new cored holes from surface as well as a short wedge cut from the second hole. According to MacEachern, Appia's QP, the company drilled a total of 3,109 m (10,200 feet).

9.2 SAMPLING METHOD AND APPROACH

Given the depth to mineralization on the Appia claims, no surface samples have been collected by Appia. The company's 2007-08 drilling program was completed using diamond drills under contract from Boart Longyear Canada Ltd. (North Bay, Ontario). All drill holes were located ashore or on an island in Quirke Lake. Thin ice development prevented drilling from locations on the lake. All core in the Teasdale Lake area was drilled using BQ-sized equipment (36.5 mm core) whereas the deeper wedged holes at Banana Lake were drilled using BTW-sized equipment. A total of 1,105 half-core samples were collected from the drill holes for analysis as well as 53 quality assurance/quality control ("**QA/QC**") samples that were inserted by the Appia geologist.

Subsequent to the initial sampling, and in response to increasing commodity prices for rare earth metals and oxides, MacEachern selected samples from the uranium-bearing 'reefs' for analysis for REE's, major elements (rock-forming oxides) and trace elements. Also included were samples from the zone located between the reefs such that the sample series represented a continuous record from just above the stratigraphically highest reef to just below the lowest reef. Material for analysis was taken from sample rejects which had remained in storage at the project laboratory in Ancaster, Ontario (Activation Laboratories).

9.3 SAMPLE PREPARATION, ANALYSIS AND SECURITY

The sampling procedure utilized by Appia's personnel during the drill program is summarized as follows:

1) the core was geologically logged and sections were selected for analysis based on geology and radiometric activity using a hand-held RS-125 Super-SPEC portable gamma ray spectrometer manufactured by Radiation Solutions of Mississauga, Ontario, Canada [8];
2) the mineralized core intervals were split in the core shack in Elliot Lake using an impact splitter until a diamond core saw was purchased after the first drill hole was completed – all core thereafter was cut;
3) one half of the drill core was bagged, a pre-numbered sample tag was placed in the bag and the samples was sealed before being sent to Activation Laboratories (ActLabs) in Ancaster, Ontario for analysis;
4) the remaining half of the core was retained in the core tray as a permanent record;
5) at the lab, the samples were dried, crushed and pulverized in preparation for analysis for uranium, and selected samples were also analyzed for gold and/or thorium; and,
6) the trays of split drill core are stored in core racks that are inside a locked building in Elliott Lake.

[8] instrument uses a 6 cubic inch NaI crystal sensor to measure a full spectrum of gamma particles in either 256 or 1025 channels. In assay mode it produces count data for the conventional total count, potassium, uranium and thorium energy windows up to a maximum of 65,000 cps. The assay mode provides equivalent concentrations for K (%), U (ppm) and Th (ppm) data based on pre-programmed stripping ratios. Sample time is user-selectable to improve precision through the use of longer count times. The instrument has an internal memory allowing for up to 1,000 samples and has both USB and Bluetooth output capabilities.

The un-split cores from overlying formations are being stored outside of the core logging building, cross-stacked and covered within a fenced area.

The reject material used for REE, major oxide and trace element analysis was processed in the same manner as the original samples. REEs contents were determined at the Ancaster lab in accordance with the Code 8-REE Assay Package. Major elements were determined by sample Fusion with an ICP(WRA) finish. Trace Elements were determined also using sample fusion with and ICP/MS (WRA4B2) finish. Analytical results showing detection limits are included at the back of this report.

9.4 DATA VERIFICATION

Due to the time that the site visit was undertaken, and the nature of the assignment, no samples could be taken of historical core for characterization purposes. WGM did not believe that analysing samples from the past producing mines would materially contribute to the project. An immense amount of data is available on the historical operations from Geological Survey of Canada sources and various research papers, some of which are summarized in the Bibliography contained herein. Many high-level technical papers are also available for purchase (download) from internet sources such as Springerlink (http://springerlink.metapress.com), the International Atomic Energy Agency website (http://www.iaea.org/DataCenter/index.html), the Geological Society of America (http://www.gsajournals.org/perlserv/?request=myprofile&a=ppv) and the British Library (https://direct.bl.uk/bld/Logon.do).

No information was available for WGM to verify concerning the estimation of mineral resources and mineral reserves in the Elliot Lake mines. WGM was able to locate and review a document regarding practices used at the Agnew Lake Mine where "geological reserves" were calculated using a cut-off grade of 0.75 lbs U_3O_8 per ton (0.38 kg/t). "Proven" reserves were restricted to reserves that occurred within 200 feet (61 m) of underground workings and were developed on two or more sides (Agnew Lake Mines, 1980). "Probable" reserves were uranium-bearing beds that occurred within 200 feet (61 m) of workings, but were only developed on one side, or alternatively, were uranium-bearing beds that had drill hole intersections closer that 400 feet (122 m) apart. "Inferred" reserves were defined as uranium-bearing beds that had drill hole intersections greater than 400 feet (122 m) apart.

WGM believes that similar practices were used for the Elliot Lake deposits. The continuity of the Elliot Lake ores is a well established fact. The reliance on data from widely spaced drill holes was common practice at the time, and supported by the uniformity of the ore and its stratiform character.

Although WGM has not seen specific mention of a dilution grade used for the conversion from geological reserves to minable reserves, a document by Agnew Lake Mines Ltd. concerning the methods used in the reserve calculation, dated 18 January, 1980, indicates that the practice at the Agnew Lake Mine was to use a zero grade for dilution purposes (Agnew Lake Mines, 1980). We are uncertain whether this was the practice in the Elliot Lake mines as the ore zones at Elliot Lake had wider shoulders of lower grading uranium-bearing rock than were present at Agnew Lake.

WGM had no information on the REE grades of the historical drill core discussed in this report. The logs that report uranium grades lack REE data. We believe that REE assaying was seldom practised as a result of the weak commodity prices that prevailed during much of the uranium mining that occurred in the Elliot Lake camp. We believe that the assured by-product nature of the yttrium-REE production coupled with the relative uniformity of yttrium and REE grades did not provide sufficient incentive for mines and explorers to incur the additional analytical costs.

9.4.1 Historical Data

The historical nature of the previous exploration and the lack of surface outcrop of the mineralization did not, nor could it, provide a basis for Appia or WGM to collect representative or meaningful samples as a check on the previous exploration work.

WGM has accepted the historical data as factual. No reasonable amount of effort on WGM's part could corroborate the previously reported drill hole data or the amount of resources remaining in underground mines. Proper verification of the past mineral resource/reserve estimate, which would include a substantial twined hole drilling program, was not possible under the current circumstances. No data or information sources that WGM gained during the course of this review could contribute materially to evaluating or auditing the stated mine reserves in respect to the remaining mineral resources. Furthermore, as no historical drill core was available for WGM to sample, no sampling of surface outcrops by WGM at this time could measurably impact current estimates of remaining reserves or resources which should be taken as order-of-magnitude.

WGM was able to verify some of the previously reported drill hole intersections insofar that the intersections are referred to in several documents originated by independent authors. We have no way of knowing whether the authors are quoting the same original source which we believe to be the mineral title assessment files of the MNDM. In the case of key data, WGM efforts to corroborate information with the MNDM met with mixed success. At the time, companies did not receive assessment credits for filing assay results and so many tended to withhold assay information at the time drill hole reports were filed. Companies could also file partial records for a drill hole, for example filing only the upper part of a hole, which might result in sufficient assessment credits to maintain the claims in good standing for another year.

Original drill hole assay certificates were unavailable for review, however many drill core assays are provided in the lithology logs. WGM had no means by which to verify the previous intersections, and no indication that an original assay data base was preserved. Nevertheless, given the well documented nature of the information available, we believe there is no reason to doubt the veracity of the historical records. WGM also believes that it is likely that such data exists in private files. It would be quite unusual of those companies with historical roots in the Elliot Lake mining camp did not maintain records of the work completed by their predecessors, and this information may be available under certain conditions. WGM also found it difficult to acquire complete information regarding uranium mining data (tonnes and grade of ore) and production data from published and internet sources as much of the information available is highly fragmented.

9.4.2 Drill Hole Collars

WGM attempted to relocate the collars for Kerr McGee drill holes as we believe these provide a means for Appia to both confirm original intersections as well as to build a resource base through wedging off the original holes. WGM used the figures attached to the drill hole logs contained in the Ministry's assessment files as a means of locating the holes. The locations were well shown and accurately drawn. Some difficulty was experienced in establishing the correct geographical frame of reference in respect to roads and terrain, however the figures were the key to relocating the holes.

WGM was successful in locating the first two Kerr McGee holes selected. The MNDM provided WGM with GPS co-ordinates for a selected group of ten hole locations, however the co-ordinates proved to be of little value as they had been measured from existing maps rather than having been measured in the field. WGM found these co-ordinates to be in error by 315 m in respect to hole 150-1 and 152 m in respect to hole 150-2. The direction of shift was not consistent between the two holes, so WGM concluded that the inaccuracy vests in the maps and not in a systemic shift (co-ordinate displacement). WGM attempted to locate hole 144-1, however time considerations did not allow for the hole to be found. WGM did determine that it was not located on a large bedrock ridge composed of Gowganda Formation on the southeast side of Quirke Lake as indicated. Rather, it seems to be located between the shore of the lake and the bedrock ridge.

Each of the drill holes located by WGM is situated on bedrock. Where the drill was located on a bedrock rise, the thin soil cover has generally prevented the forest from re-establishing itself (Plate 11). However, hole 150-1 was drilled in a small depression made where a tractor or bulldozer excavated the soil cover to expose bedrock – this site was substantially over-grown by trees to 10 cm diameter, and was it difficult to see the casing pipe even from within 5-10 m distance (Plate 12). The casing in each hole stands approximately 75-100 cm above the ground level. The casing appears to be BW size which would be typical for BQ drill pipe (core). Several sets of hold-down bolts are also present at each site. These are 2-3 cm rods which were used as a means of anchoring the drilling rig to bedrock.

WGM measured the co-ordinates for the holes using both the NAD-27 (Canada) datum used by the MNDM as well as with the WGM-84 datum which is more conventionally used for GPS navigation at mid-latitudes. The locations were determined using the long-count averaging function of the GPS instrument. At each drill hole collar, 500 readings taken at a rate of one reading per second, were averaged giving an estimated position error of less than 3.5 metres. The chart datum was then changed and the measurements were repeated. The difference between the two set of co-ordinates was 2.7 and 4.7 metres with the WGS-84 locations due (precisely) west of the NAD-27 locations.

Plate 11: WGM geologist Al Workman surveying location of casing at Kerr McGee diamond drill hole 150-2 in 2007 – four tie-down rock bolts are also visible.

Plate 12: Bob MacGregor at location of casing for Kerr KcGee diamond drill hole 150-1, also drilled on bedrock, however the site partially obscured in a water-filled excavation. In 2007, the site was substantially more overgrown than at hole 150-2.

Averaging the UTM co-ordinates for the each of the holes located by WGM, the locations are as follows:

150-1	Zone 17T	0377127.5 E	5146200 N	428.0 m elev.
150-2	Zone 17T	0371857.5 E	5145545 N	399.5 m elev.

On the basis of its fieldwork and conversations with MNDM personnel and with Bob McGregor, WGM believes that Kerr McGee made a consistent practice of leaving its casing in the bedrock to provide a point of entry should additional coring and sampling be required in its drill holes. WGM acquired a set of drill logs for the holes drilled in the area of the Appia property, however no information was available for Kerr McGee holes 150-1 and 156-5. While in the offices of the MNDM in Sault Ste. Marie, WGM spot tested several of the records provided to it by Appia and found them to compare favourably with the Ministry's records.

Subsequent to WGM's efforts, Appia retained stakers to relocate all of the previous holes deemed to be relevant to the major deposits discussed herein. These efforts were largely successful, and as a result, the original drill hole locations were essentially confirmed.

9.4.3 Historical Mineral Resources

Original drill hole assay certificates were not available for review, however the assays for samples taken from the drill holes are provided on the lithology logs. WGM had no means by which to verify the previous intersections, and no indication that an original assay data base was preserved. Nevertheless, given the well documented nature of the information available, we believe there is no reason to doubt the veracity of the historical records.

In testing the previous resource estimate, WGM modelled the resources using a simplified model that duplicated the polygonal approach used previously, and applied a variety of variables to the in-puts that might represent a reasonable range of best-estimate scenarios. The historical resource estimate employed the concept of "area of influence" whereby differences in size between different areas (or blocks) account for the nature of the continuity of the deposit in the horizontal direction. In creating the block model, WGM decided to keep all of the blocks horizontal as this approach best emulated Sprague's procedures. Volume was calculated as the area of influence multiplied by the thickness of the deposit for that area of influence, all the calculations assuming horizontal continuity. This simplification does not take into consideration the 17^{o} southerly dip of the overall deposit, however in the context of a test scenario, WGM did not believe that this would create a significant difference in overall calculations given the small size of the blocks with respect to the size and high continuity of the uraniferous mineralization. Although WGM evaluated the use of 2-metre and 5-meter intervals for assay compositing, WGM concluded that a 1-metre intervals was best based on the length of the intercepts in the drill holes. The greater lengths would certainly affect the tails of the grade distribution curves.

Based on Sprague's report, WGM measured a representative area of influence using the map provided and determined that the maximum area of influence was 1,000,000 square feet (92,903 m^2 or 9.3 ha) centred on the polygon created when the grade-intercept was projected to surface. A calibration procedure was then performed to determine the radius of the search ellipsoid that was needed to reproduce Sprague's historical resources.

WGM calibrated its search ellipsoid using the available drill holes in the category previously referred to as "drill indicated": holes E-9, C-12, C-14, C-15, C-16, C-17, C-18, C-19, C-20, E-44, E-45, NR-6, R-1, R-3.3A, R-5. The tonnage and grade information for these drill holes was extracted from Sprague's report. A process of trial and error was used to determine the search radius (89 m) that provided results comparable to the historical estimate in the Sprague report. The details are provided in Table 8. A cut-off grade of 0.65 lbs U_3O_8/ton produced a resource that was comparable with Sprague's "Drill Indicated" category using the same data. Note that drill holes 18 and 18-A were excluded from this calibration procedure because of not being present in the original report (but present in the information provided by Appia).

Following the initial test validation, WGM took the foregoing data an additional step by combining the new Appia drill holes with Sprague's drill hole data to produce an estimate for the Teasdale Zone which serves as a substantive audit of the historical estimate. As shown in Table 9, WGM's use of a cut-off between 0.65 and 0.70 lbs U_3O_8/ton produces a resource which is comparable to Sprague's historical estimate of 17.5 M tons averaging 1.21 lbs U_3O_8/ton (20.79 Mlbs of contained U_3O_8). WGM believes that this serves as a reasonable verification of the historical results, notwithstanding the fact that they are not compliant with current standards, nor would WGM affirm the estimation procedure used.

Table 8
WGM Verification of Drill-Indicated Resources*, Teasdale Zone, Using 89 m Search Ellipse and Varying Cut-off Grade

Cut-Off Grade (lbs U_3O_8/ton)	Volume (m^3)	Tonnage (tons)	Contained Metal (lbs U_3O_8)	Average Grade (lbs U_3O_8/ton)
0.05	3,302,400.00	10,052,501.96	7,634,869.08	0.76
0.10	3,280,000.00	9,984,316.36	7,631,131.42	0.76
0.20	3,228,800.00	9,828,463.55	7,615,546.13	0.77
0.25	2,924,800.00	8,903,089.11	7,417,119.94	0.83
0.30	2,764,800.00	8,416,048.68	7,282,989.49	0.87
0.35	2,548,800.00	7,758,544.86	7,068,367.10	0.91
0.40	2,454,400.00	7,471,191.08	6,959,317.78	0.93
0.45	1,928,000.00	5,868,834.46	6,314,157.72	1.08
0.50	1,867,200.00	5,683,759.21	6,226,272.71	1.10
0.55	1,716,800.00	5,225,941.21	5,989,644.44	1.15
0.60	1,630,400.00	4,962,939.46	5,841,075.54	1.18
0.65	1,441,600.00	4,388,232.02	5,492,372.95	1.25
0.70	1,300,800.00	3,959,636.46	5,202,152.89	1.31
0.75	1,276,800.00	3,886,580.46	5,148,966.08	1.32
0.80	1,254,400.00	3,818,394.87	5,097,146.47	1.33
0.85	1,182,400.00	3,599,226.78	4,919,839.70	1.37
0.90	1,046,400.00	3,185,242.43	4,558,958.37	1.43
0.95	920,000.00	2,800,480.53	4,199,038.61	1.50
1.00	894,400.00	2,722,554.14	4,122,360.21	1.51
1.05	822,400.00	2,503,386.04	3,903,192.12	1.56
1.10	772,800.00	2,352,403.64	3,742,080.15	1.59
1.15	748,800.00	2,279,347.64	3,658,796.32	1.61
1.20	702,400.00	2,138,106.05	3,493,483.63	1.63
1.30	624,000.00	1,899,456.33	3,197,892.80	1.68
1.40	601,600.00	1,831,270.74	3,106,796.10	1.70
1.45	438,400.00	1,334,489.49	2,407,309.22	1.80
1.50	414,400.00	1,261,433.50	2,299,622.79	1.82
1.60	206,400.00	628,281.56	1,343,272.75	2.14
1.80	182,400.00	555,225.57	1,222,889.55	2.20
1.95	136,000.00	413,983.97	968,654.68	2.34
2.00	115,200.00	350,668.78	842,960.60	2.40
2.50	73,600.00	224,038.41	588,120.77	2.63
2.80	22,400.00	68,185.59	193,100.44	2.83

* In auditing the historical estimate, these resources were calculated by WGM using only that data which previously supported the historical resources that were classified as "Drill-Indicated". These resources are not compliant with National Instrument 43-101.

Table 9
WGM Verification of Sprague Global Resources* Using 89 m Search Ellipse and Varying Cut-off Grade, Teasdale Zone

Cut-Off Grade (lbs U_3O_8/ton)	Drill-Indicated Category			Drill-Inferred Category			Global Drilled Resources			
	Volume (m^3)	Tonnage (tons)	Contained Metal (lbs U_3O_8)	Volume (m^3)	Tonnage (tons)	Contained Metal (lbs U_3O_8)	Volume (m^3)	Tonnage (tons)	Contained Metal (lbs U_3O_8)	Average Grade (lbs U_3O_8/ton)
0.05	5,753,600	17,513,937	10,424,680	12,332,800	37,541,227	22,826,797	18,086,400	55,055,164	33,251,478	0.60
0.1	5,438,400	16,554,470	10,356,895	11,670,400	35,524,869	22,686,153	17,108,800	52,079,339	33,043,048	0.63
0.15	5,097,600	15,517,077	10,233,615	10,894,400	33,162,703	22,405,969	15,992,000	48,679,780	32,639,585	0.67
0.2	4,814,400	14,655,017	10,080,407	10,329,600	31,443,448	22,101,274	15,144,000	46,098,466	32,181,680	0.70
0.25	4,131,200	12,575,364	9,635,128	8,912,000	27,128,186	21,177,132	13,043,200	39,703,550	30,812,260	0.78
0.3	3,803,200	11,576,934	9,363,827	8,222,400	25,029,028	20,606,196	12,025,600	36,605,962	29,970,023	0.82
0.35	3,497,600	10,646,689	9,055,724	7,574,400	23,056,506	19,953,860	11,072,000	33,703,195	29,009,584	0.86
0.4	3,299,200	10,042,759	8,826,842	7,168,000	21,819,430	19,485,086	10,467,200	31,862,190	28,311,928	0.89
0.45	2,680,000	8,157,921	8,063,428	5,899,200	17,957,129	17,919,467	8,579,200	26,115,050	25,982,894	0.99
0.5	2,574,400	7,836,474	7,910,630	5,670,400	17,260,664	17,588,233	8,244,800	25,097,139	25,498,864	1.02
0.55	2,366,400	7,203,322	7,585,566	5,200,000	15,828,774	16,854,296	7,566,400	23,032,096	24,439,863	1.06
0.6	2,219,200	6,755,245	7,331,808	4,875,200	14,840,087	16,293,743	7,094,400	21,595,332	23,625,551	1.09
0.65	**1,886,400**	**5,742,204**	**6,710,022**	**4,187,200**	**12,745,800**	**15,008,723**	**6,073,600**	**18,488,004**	**21,718,745**	**1.17**
0.7	1,700,800	5,177,237	6,326,797	3,752,000	11,421,058	14,110,495	5,452,800	16,598,295	20,437,292	1.23
0.75	1,632,000	4,967,810	6,175,970	3,598,400	10,953,500	13,773,734	5,230,400	15,921,310	19,949,704	1.25
0.8	1,513,600	4,607,400	5,896,468	3,392,000	10,325,220	13,286,367	4,905,600	14,932,621	19,182,835	1.28
0.85	1,425,600	4,339,528	5,679,943	3,182,400	9,687,200	12,770,934	4,608,000	14,026,728	18,450,877	1.32
0.9	1,244,800	3,789,173	5,202,371	2,763,200	8,411,161	11,663,204	4,008,000	12,200,334	16,865,575	1.38
0.95	1,120,000	3,409,281	4,847,010	2,497,600	7,602,678	10,907,113	3,617,600	11,011,959	15,754,123	1.43
1	1,072,000	3,263,169	4,704,523	2,390,400	7,276,361	10,588,868	3,462,400	10,539,530	15,293,391	1.45
1.05	998,400	3,039,131	4,480,339	2,217,600	6,750,358	10,062,562	3,216,000	9,789,489	14,542,901	1.49
1.1	856,000	2,605,665	4,016,521	1,900,800	5,786,023	9,031,814	2,756,800	8,391,688	13,048,334	1.55
1.15	809,600	2,464,423	3,855,914	1,804,800	5,493,799	8,699,525	2,614,400	7,958,222	12,555,439	1.58
1.2	712,000	2,167,328	3,507,260	1,593,600	4,850,908	7,944,387	2,305,600	7,018,236	11,451,646	1.63
1.25	657,600	2,001,735	3,302,845	1,486,400	4,524,591	7,542,673	2,144,000	6,526,326	10,845,517	1.66
1.3	633,600	1,928,679	3,209,545	1,436,800	4,373,608	7,349,854	2,070,400	6,302,287	10,559,399	1.68
1.4	612,800	1,865,364	3,124,955	1,398,400	4,256,719	7,193,688	2,011,200	6,122,082	10,318,643	1.69
1.45	449,600	1,368,582	2,425,468	1,036,800	3,156,014	5,643,836	1,486,400	4,524,596	8,069,304	1.78
1.5	425,600	1,295,526	2,317,782	987,200	3,005,031	5,421,284	1,412,800	4,300,557	7,739,066	1.80
1.55	219,200	667,245	1,368,932	526,400	1,602,363	3,303,156	745,600	2,269,608	4,672,088	2.06
1.6	196,800	599,059	1,260,515	476,800	1,451,381	3,063,090	673,600	2,050,440	4,323,606	2.11
1.8	172,800	526,003	1,140,132	427,200	1,300,398	2,814,298	600,000	1,826,401	3,954,430	2.17
1.95	126,400	384,762	885,897	321,600	978,951	2,235,693	448,000	1,363,713	3,121,591	2.29
2	105,600	321,446	760,203	270,400	823,098	1,926,292	376,000	1,144,545	2,686,496	2.35
2.5	64,000	194,816	505,363	155,200	472,429	1,220,581	219,200	667,245	1,725,944	2.59
2.8	12,800	38,963	110,343	25,600	77,926	220,686	38,400	116,890	331,029	2.83

* These resources were calculated by WGM using only that data which previously supported the historical resources that were classified as "Drill-Indicated". These resources are not compliant with National Instrument 43-101.

WGM's testing of the historical resource estimate confirmed that the Teasdale Lake Zone had the potential to contain the historical resources as estimated by Sprague (see Table 5) totalling some 6.6 million tons grading 1.3 lbs U_3O_8/ton (Mine Indicated and Drill Indicated) and 10.9 million tons grading 1.2 lbs U_3O_8/ton (Possible). As already stated in this report, these resources were based on data that were largely unconfirmed at the time of WGM's test, and the original estimate used techniques that do not comply with the current rules in NI 43-101 and standards developed by the CIM. The historical resource was considered unreliable, however these circumstances have changed with the completion of Appia's confirmation drilling in the Teasdale Lake Zone as reported herein.

WGM observed core angles for the sedimentary bedding in the drill holes completed at Banana Lake by Appia. WGM concluded that the uranium-bearing horizons in the Matinenda Formation were essentially flat-lying. In this respect, the core lengths reported for interesting uranium-bearing sections are essentially true thicknesses. Core angles reported for bedding in the Teasdale drilling vary between 15 and 20 degrees which is the true dip of the uranium-bearing formations in this area. On this basis, the true thickness of mineralized intersections is reduced to 94% to 96% of the intersection length.

Lastly, WGM found it difficult to acquire detailed information regarding uranium mining data (tonnes and grade of ore) and production data from internet sources. WGM believes that it is likely that a complete Elliot Lake database exists in private files, and we believe that such a database may exist in Cameco's historical archives or in the archives of various Canadian Federal nuclear industry regulators.

9.5 AIRBORNE GEOPHYSICAL SURVEYING

On 24 January, 2007, Fugro Airborne Surveys of Ottawa, Ontario carried out an airborne MEGATEM magnetic and electromagnetic survey of the Appia claims in the Elliot Lake area. A total of 429 line-kilometres of surveying was completed on 56 profile lines using a De Havilland Dash 7 aircraft as a survey platform. The line length varied from 4 to 11 kilometres, and the line spacing was 200 m. WGM reviewed the summarized results of this survey and some of the flight line data. However, the usefulness of the initial survey report was limited by a complete lack of interpretative analysis. This was corrected in a Fugro report dated April, 2007 which is an interpretation of the survey data.

The magnetic survey showed a low magnetic feature representing the Quirke Lake syncline (basin) in the vicinity of Quirke Lake. A lobate magnetic high was observed SE of Quirke Lake and interpreted by Fugro to represent a near-surface intrusion. A series of NW-trending features and WNW-trending lineaments were also noted and ascribed to magnetic dikes and possible faults.

The electromagnetic survey resulted in the detection of several small anomalies and several broad anomalous zones, all, of with were ascribed to cultural features. Two weak near surface anomalies were interpreted as "conductive lake bottom sediments".

9.6 INDUCED POLARIZATION SURVEYING

During September, 2006, Quincy Energy Corp. (later to become Energy Metals Corp. - "**EMC**" through amalgamation) completed a 3-line IP survey over portions of the EMC Option as a means of testing the ability of the surveying technique to detect broad regional trends that might provide guides to uranium mineralization. An electrode spacing of 500 feet (152 m) was used with a dipole-dipole configuration to collect data for n=1 to n=6. Some deep electrical sounding was also performed. The survey was completed by Gradient Geophysics Inc. of Missoula, Montana.

The resistivity data from the survey showed "large scale structures" which did not have a coincident chargeability anomaly. Drilling was recommended by Gradient Geophysics Inc. to test the potential use of the surveying method. Vertical, near-surface fault structures were identified as targets.

Given the depth to the Matinenda Formation in the area of two of the profiles (line 0 and line 1), estimated to be approximately 1,160 m (3,800 feet) based on Kerr McGee drill hole 144-1, WGM is of the view that there is virtually no possibility that the IP survey provided useable information concerning the uranium-bearing quartz pebble conglomerates. Survey line 2 extended from an area near the Roche drilling on the western side of Quirke Lake southwards to the main access road. As the depth to the Matinenda at the north end of the profile is approximately 600 m (2,000 feet), this line might have provided some useful information, however a large percentage of the survey profile was lost due to surface interference. WGM does not agree that drilling the conductive zones identified by Gradient Geophysics Inc. represents a workable plan for future exploration in this area. The depth to the uraniferous Matinenda Formation is relatively well known on the EMC Option, and only geological modelling based on the well established geometry of the uranium-bearing horizons can be used as a way forward in exploration planning.

10. DRILLING

10.1 PHASE ONE DRILLING PROGRAM

10.1.1 Summary

Between 18 November, 2007 and 12 March, 2008, Appia completed a total of 10 diamond drill holes totalling 3,885.2 metres on its Elliot Lake claims using two Longyear 38 drills. This drilling consisted of six new holes in the Teasdale Lake area and 4 holes that were wedged at depth from existing holes drilled in the Banana Lake area by a previous operator (Kerr McGee) as follows:

Target Area	No. of Holes	Core Size	Total Meterage
Teasdale Lake Zone	6	BQ	2,644.0
Banana Lake Zone	4 (wedged)	BTW	1,241.2
Total	10		3,885.2

All of the drill holes locations were situated on-shore due to seasonal conditions when the drilling took place and/or thin ice conditions that prevailed during the winter of 2007-08. The Teasdale drilling program was supported by helicopter which enabled the company to place one of the drills on a small island in Quirke Lake. A BH 205 A1 type helicopter owned and operated by Superior Helicopters[9] based in Longlac, Ontario was used.

A summary of drill hole locations and other statistics follows in Table 10. All drill hole collars were surveyed by GPS using the NAD 83 datum. Appia used a single GPS location measurement which was compared to two subsequent measurements. If the readings were within the estimated position error, the first reading was accepted by Appia as the official hole location.

Down hole control in all holes was provided using a Reflex EZ-Shot, a down-hole surveying instrument that provides electronic single shot surveying in a non-magnetic environment. The instrument can measure six parameters in one single shot: azimuth, inclination, magnetic tool face angle, gravity roll angle, magnetic field strength and temperature. All measured data is

[9] Superior Helicopter, Box 120, 121 Lakeview Drive, Longlac, Ontario, P0T 2AO; Telephone: (807)-876-4364; Fax: (807) 876-4510; e-mail address: superiorheli@sympatico.ca

stored until the start of next survey, and post-processing of survey data is possible with the Reflex Process application.

Table 10
Appia Diamond Drill Hole Locations and Set-Up Information, 2007-08 Drilling Program

Drill Hole	Claim Number	Geographic and UTM Co-Ordinates					Bearing	Dip	Length (m)
		Latitude	Longitude	Zone	Easting	Northing			
Q-07-01	3009181	46° 29' 16.35"	82° 31' 20.97"	17T	383151	5149382	0	-90	327.0
Q-07-02	3009180	46° 28' 45.52"	82° 31' 24.33"	17T	383061	5148432	0	-90	609.0
Q-07-03	3009192	46° 28' 52.28"	82° 31' 49.52"	17T	382528	5148651	0	-90	546.0
Q-08-04	3009180	46° 29' 02.17"	82° 30' 55.30"	17T	383690	5148934	0	-90	410.0
Q-08-05	3009181	46° 29' 12.41"	82° 31' 09.89"	17T	383385	5149256	0	-90	375.0
Q-08-06	3009183	46° 28' 55.43"	82° 29' 51.32"	17T	385050	5148700	0	-90	377.0
BL-07-01-W1	3019234	46° 27' 03.30"	82° 41' 24.35"	17T	370200	5145537	0	-90	345.0
BL-07-01-W2	3019234	46° 27' 03.30"	82° 41' 24.35"	17T	370200	5145537	0	-90	317.6
BL-08-02-W1	3019234*	46° 27' 18.85"	82° 41' 56.75"	17T	369519	5146032	0	-90	125.6
BL-08-02-W2	3019234*	46° 27' 18.85"	82° 41' 56.75"	17T	369519	5146032	0	-90	453.0

Note: * - very close to the west boundary, with claim # 4201501.

The four holes wedged from existing historical holes located in the Banana Lake area were commenced and completed as follows below. "W1" and "W2" refer to the first and second wedges set from each of the two original holes.

Hole	Depth of Wedge	Completion (Total) Depth	Length Drilled
BL-07-01-W1	1,179.0 m	1,524.0 m	345.0 m
BL-07-01-W2	1,169.6 m	1,487.2 m	317.6 m
BL-08-02-W1	1,397.4 m	1,523.0 m	125.6 m
BL-08-02-W2	1,067.0 m	1,520.0 m	453.0 m

Appia analysed a total of 1,158 samples from the 10 diamond drill holes during the course of the 2007-08 drilling program. This included a total of 1,105 regular drill core samples and 53 QA/QC samples.

10.1.2 Banana lake Drill Holes BL-07-01-W1 and W2

In the Banana Lake Zone, two holes were wedged off hole KM 150-5, a historical hole completed in 1969 by Kerr McGee that intersected 0.88 lbs U_3O_8 per ton over 13.4 m (44 ft).

The first wedged hole (BL-07-01-W1) commenced at a depth of 1,179 m and extended to 1,524 m. The hole was drilled in order to confirm mineralization reported by Kerr McGee.

The uranium-bearing horizon, an interbedded quartzite and quartz-pebble conglomerate in the Matinenda Formation was intersected from approximately 1,414.41 to 1,481.9 m. The total thickness of the zone within which the uranium-bearing horizons are located was about 67.5 m. The best mineralized zone, averaging 0.433 lbs/ton U_3O_8, occurred at 1,440.68 to 1,476.25 m over an intersected length of 35.57 m. The highest uranium values were localized within narrow (centimetre to decimetre thick) quartz-pebble conglomerate beds containing with smoky quartz pebbles and approximately 5-15% pyrite. The top of the basement rock, which is mafic metavolcanic in composition, was intersected at 1,481.9 metres. Between 1,120.82 and 1,466.61 m, the drill hole intersected 0.461 lbs U_3O_8 per ton across a core length of 45.79 m. Additional sections within this zone are summarized in Table 11.

The second hole wedged at this set-up (BL-07-01-W2) was started at 1,169.59 m and drilled to a depth of 1,487.2 m for a total completion length of 317.61 m. The uranium-bearing horizon was intersected from approximately 1,411.40 to 1,479.22 m, over an apparent thickness of 67.82 m. The best mineralization was intersected over a 15.85 m interval between 1,442.0 and 1,457.85 metres – this averaged 0.55 lbs U_3O_8/ton. This and other intervals are summarized in Table 11. The top of the metavolcanic basement rock was intersected at 1,487.2 m.

Table 11
Uranium-Bearing Intervals in Wedged Appia Drill Holes BL-07-01-W1 and W2

DDH Name	Interval (metres)			Width	Grade	
	From	To	Width	(Feet)	lbs U_3O_8 / ton	lbs ThO_2 / ton
BL-07-01-W1	1420.82	1466.61	45.79	150.24	0.461	n/a
including	1435.86	1466.61	30.75	100.89	0.556	0.18
	1444.09	1466.61	22.52	73.89	0.688	0.20
	1444.09	1461.22	17.13	56.20	0.782	0.18
	1448.40	1451.30	2.90	9.51	1.058	0.22
	1457.57	1461.22	3.65	11.98	1.096	0.18
	1459.74	1461.22	1.48	4.86	1.880	0.29
BL-07-01-W2	1421.54	1462.18	40.64	133.34	0.41	0.16
including	1442.00	1457.85	15.85	52.00	0.55	0.12
	1442.00	1444.56	2.56	8.40	0.81	0.20
	1443.70	1444.56	0.86	2.82	1.39	0.28

The intersections achieved in these steeply dipping holes are considered to be very close, within 5-7%, of the true thickness of the mineralized zones. The intervals and grades in the Appia holes are similar to those reported by Kerr McGee. Appia's intersections are 18%-28% longer and the grades are 11%-37% lower which demonstrates a normal trade-off between volume (tonnage) and grade.

10.1.3 Banana Lake Drill Holes BL-08-02-W1 and W2

A second pair of wedged holes, BL-08-02-W1 and W2, was drilled from former Kerr McGee drill hole KM 156-5 which intersected 0.65 lbs U_3O_8 per ton over 10.4 m (34 ft).

The first wedged hole was initiated at a depth of 1,397.4 m and was drilled a total length of 125.6 m until it was terminated at 1,523 m. This hole was located about 835 m north-northwest of former Kerr McGee drill hole KM 150-5 (see Figure 8). The interbedded quartzite-conglomerate unit in the Matinenda Fm. that contains uranium mineralization was intersected between 1,444.0 and 1,488.91 m. The total intersected thickness of the uranium-bearing zone was 44.91 m. The better mineralized portion of this zone was located at 1,444.0 to 1,481.0 m – an apparent thickness of 37 m averaging 0.425 lbs U_3O_8/ton. The better uranium values were associated with narrow (normally a few centimetres thick) quartz-pebble conglomerate beds containing smoky quartz pebbles with about 5-15% pyrite. This hole intersected several, narrow higher grading intervals with values greater than 5 lbs U_3O_8/ton including a narrow interval containing 8.68 lbs U_3O_8/ton over 0.15 m at 1,469.5-1,469.65 m and 6.52 lbs U_3O_8/ton over 0.28 m at 1,457.25-1,457.53 m. Many other samples carried between 1 and 4 lbs U_3O_8/ton. The various uranium-bearing horizons are summarized as follows in Table 12. The top of basement rock, which is mafic metavolcanic in composition, was intersected at 1,516.4 m.

Table 12
Uranium-Bearing Intervals in Appia Wedged Drill Holes BL-08-02-W1 and W2

DDH Name	Interval (metres)			Width	Grade	
	From	To	Width	(Feet)	lbs U_3O_8 / ton	lbs ThO_2 / ton
BL-08-02-W1	1444.00	1481.00	37.00	121.40	0.425	0.14
including	1457.25	1471.95	14.70	48.23	0.625	0.16
	1457.25	1459.47	2.22	7.28	1.148	0.23
	1457.25	1457.53	0.28	0.92	6.521	0.81
	1466.50	1469.65	3.15	10.34	1.206	0.23
BL-08-02-W2	1440.68	1476.25	35.57	116.71	0.433	0.06
including	1451.92	1476.25	24.33	79.83	0.510	0.08
	1462.73	1465.90	3.17	10.40	1.259	0.30
	1463.71	1465.90	2.19	7.19	1.480	0.37
	1464.11	1464.80	0.69	2.26	2.039	0.48

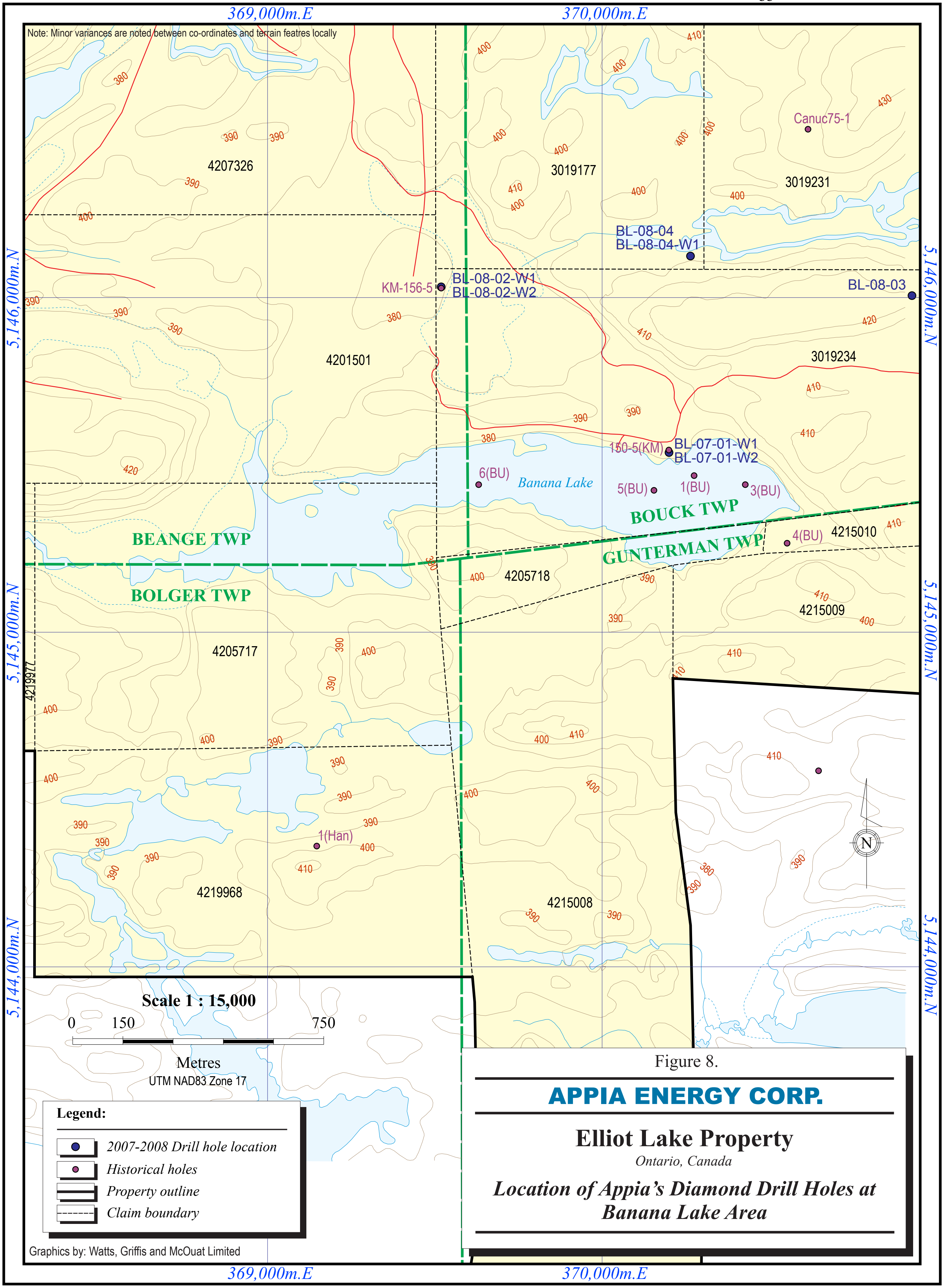


Figure 8.

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Location of Appia's Diamond Drill Holes at Banana Lake Area

The second hole wedged from Kerr McGee's KM 156-5 was started at 1,169.59 m. Appia drilled to a final depth of 1,520 m. The top of the uranium-bearing horizon was intersected at 1,434.27 m and it continued over a core length of 41.98 m to a depth of 1,476.25 m. Several narrow higher grading intervals were present with values exceeding 5.0 lbs U_3O_8/ton, including zones up to 7.64 lbs U_3O_8/ton over 0.1 m at 1,460.85-1,460.95 m and 7.24 lbs U_3O_8/ton over 0.13 m at 1,465.77-1,465.90 m. The major uranium-bearing intervals are summarized in Table 12. The top of the basement sequence was intersected at 1,505.28 m.

Like with the first wedged set of holes, the Appia intersections are considered to be very close, within 5-7%, of the true thickness of the mineralized zones. The intervals and grades in the Appia holes are similar to those reported by Kerr McGee, and are actually higher if selected intervals are taken to match the Kerr McGee thicknesses. In one cut, Appia's intersection is 41% longer yet the grade is only 4% lower. In the second cut, Appia's intersection is more than twice (234%) the length of the Kerr McGee intersection yet the grade is only 21% lower. The Appia assays show a normal trade-off between volume (tonnage) and grade, but possibly show potential for grade/tonnage improvement in the historical resource estimate made by Rio Algom.

10.1.4 Teasdale Drill Hole Q-07-01

This hole, drilled to a total depth of 327 m, was located on the eastern shore of Quirke Lake and intersected several narrow, uranium-bearing conglomerate horizons ranging in thickness from a few centimetres to a fraction of a metre. The top of the uranium-bearing horizon, which is an interbedded quartz-pebble conglomerate and quartzite of the Matinenda Formation, can be placed at 239.63 m. and the bottom of the horizon is at 248.7 m. The total thickness of the mineralized horizon is approximately 9.07 m with an average grade of 0.52 lbs U_3O_8/ton and 3.00 lbs REE_{TOTAL}/ton. An additional uranium-bearing horizon was encountered over a 93 cm interval in the lower portion of the Matinenda at 286.87 m with an average value of 0.91 lbs U_3O_8/ton but significantly less REEs (0.67 lbs REE_{TOTAL}/ton). The upper and lower uranium-bearing zones were separated by an essentially barren 38.17 m thick horizon of quartzite. The top of the basement granite was intersected at 288.19 m. The mineralized intersections is summarized in Table 13.

Table 13
Uranium-Bearing Intervals in Appia Holes Drilled on the Teasdale Lake Zone

DDH Name	Interval (metres)		Interval Width		Grade		
	From	To	Metres	Feet	lbs U_3O_8 / ton	lbs REEs/ton	lbs ThO_2 / ton
Q-07-01	239.63	248.70	9.07	29.76	0.519	3.00	0.67
including	246.82	248.70	1.88	6.17	0.734	1.94	0.45
	247.35	248.70	0.65	2.13	1.008	3.37	0.55
	286.87	287.80	0.93	3.05	0.91	0.67	n/a
Q-07-02	544.35	551.80	7.45	24.44	0.644	4.14	0.90
including	548.06	551.80	3.74	12.27	1.051	5.70	1.27
	548.06	550.00	1.94	6.37	1.391	5.87	1.33
	549.70	550.00	0.30	0.98	2.690	5.23	1.31
Q-07-03	486.38	493.94	7.56	24.80	0.709	3.95	0.77
including	490.70	492.34	1.64	5.38	0.908	3.31	0.67
	490.70	491.07	0.37	1.21	1.404	5.48	1.18
Q-08-04	349.05	354.90	5.85	19.19	0.505	3.53	0.65
including	349.55	351.60	2.05	6.73	0.821	6.31	1.11
	349.55	350.50	0.95	3.12	1.123	9.10	1.54
Q-08-05	296.93	302.90	5.97	19.59	0.656	2.80	0.61
including	300.52	302.90	2.38	7.81	1.004	2.00	0.51
	301.26	302.90	1.64	5.38	1.214	1.79	0.45
	302.09	302.90	0.81	2.66	2.350	2.86	0.71
Q-08-06	326.87	333.31	6.44	21.13	0.404	2.41	0.53
including	331.11	333.31	2.20	7.22	0.712	1.52	0.43
	331.66	332.26	0.60	1.97	1.439	2.66	0.35

The average content for rare earth elements are reported as total REEs

10.1.5 Teasdale Drill Hole Q-07-02

Q-07-02 was a 609.0 m deep hole that was drilled on the eastern shoreline of Quirke Lake and located very close to a collar of a historical DDH named R-1 that was drilled by Roche Long Lac Mines (Roche) in the 1950s. Mining Recorder records show that R-1 intersected a 0.6 m thick horizon (556.4 - 557.0 m) averaging 1.1 lbs U_3O_8/ton. The Appia hole intersected several uranium-bearing conglomerate horizons ranging in thickness from a few centimetres to a fraction of a metre starting at 554.35 m. The various intersections are summarized in Table 13. The top of the metavolcanic basement rock was intersected at 572.6 m.

10.1.6 Teasdale Drill Hole Q-07-03

Drilled near the eastern shore of a tiny island located in eastern Quirke Lake, this hole was located next to a historical Roche 1950-era drill hole collar for R-6. As of the date of this report, no information concerning R-6 was available to the author. The Appia hole intersected several uranium-bearing conglomerates ranging in thickness from a few centimetres to a fraction of a metre. These intersections are summarized in the foregoing Table 13. Basement rock comprising pink granite was encountered at 520.0 m.

10.1.7 Teasdale Drill Hole Q-08-04

This hole was drilled near the south-western shoreline of Teasdale Lake, a small lake located immediately east of Quirke Lake. The hole was collared near an old diamond drill hole collar for a hole named C-19, reportedly drilled by Conecho Mines Ltd. in the early to middle 1950s. Mining Recorder records indicated that C-19 intersected a 1.5 m thick zone with an average grade of 1.42 lbs U_3O_8/ton (0.071% U_3O_8). The Appia hole Q-08-04 intersected several uranium-bearing intervals starting at 343.6 m, however better values were encountered from 349.05 to 354.9 m in a 5.85 m thick interval averaging 0.505 lbs U_3O_8 /ton. The intersection that most closely matched the historical report returned 0.821 lbs U_3O_8 /ton across 2.05 m between 349.55 m and 351.60 m. Compared to the original hole, this intersection marks a 44% increase in apparent thickness and a 42% decrease in grade – these results appear to be a trade-off of grade against volume. The intersections in this hole are summarized in Table 13. Pinkish granite basement rock was encountered below 410.0 m.

10.1.8 Teasdale Drill Hole Q-08-05

The Appia hole was collared close to the collar of historical drill hole collar C-15, a hole completed near the north-western shore of Teasdale Lake by Conecho in the early to middle 1950s. Conecho reported an intersection of 1.5 m with an average grade of 1.38 lbs U_3O_8/ton (0.069% U_3O_8). In the Matinenda Fm. Appia's new hole intersected a 12.9 m thick uranium-bearing zone at 290.0-302.9 m with an average value of 0.451 lbs U_3O_8/ton (0.0225% U_3O_8). Within this zone, Appia's intersection of 1.214 lbs U_3O_8/ton over 1.64 m at 301.26-302.90 m confirmed the earlier Conecho report. The Appia intersection was 9% longer with a 12% diminishment of grade. Mineralization was hosted within a section of interbedded quartz-pebble conglomerate and quartzite. As seen in all other Appia holes, high uranium values were associated with quartz-pebble conglomerate horizons and those that had the higher pyrite contents generally had higher uranium contents. The Appia intersections are summarized in Table 13. Metamorphic basement in the form of pinkish granite was encountered at 349.1 m.

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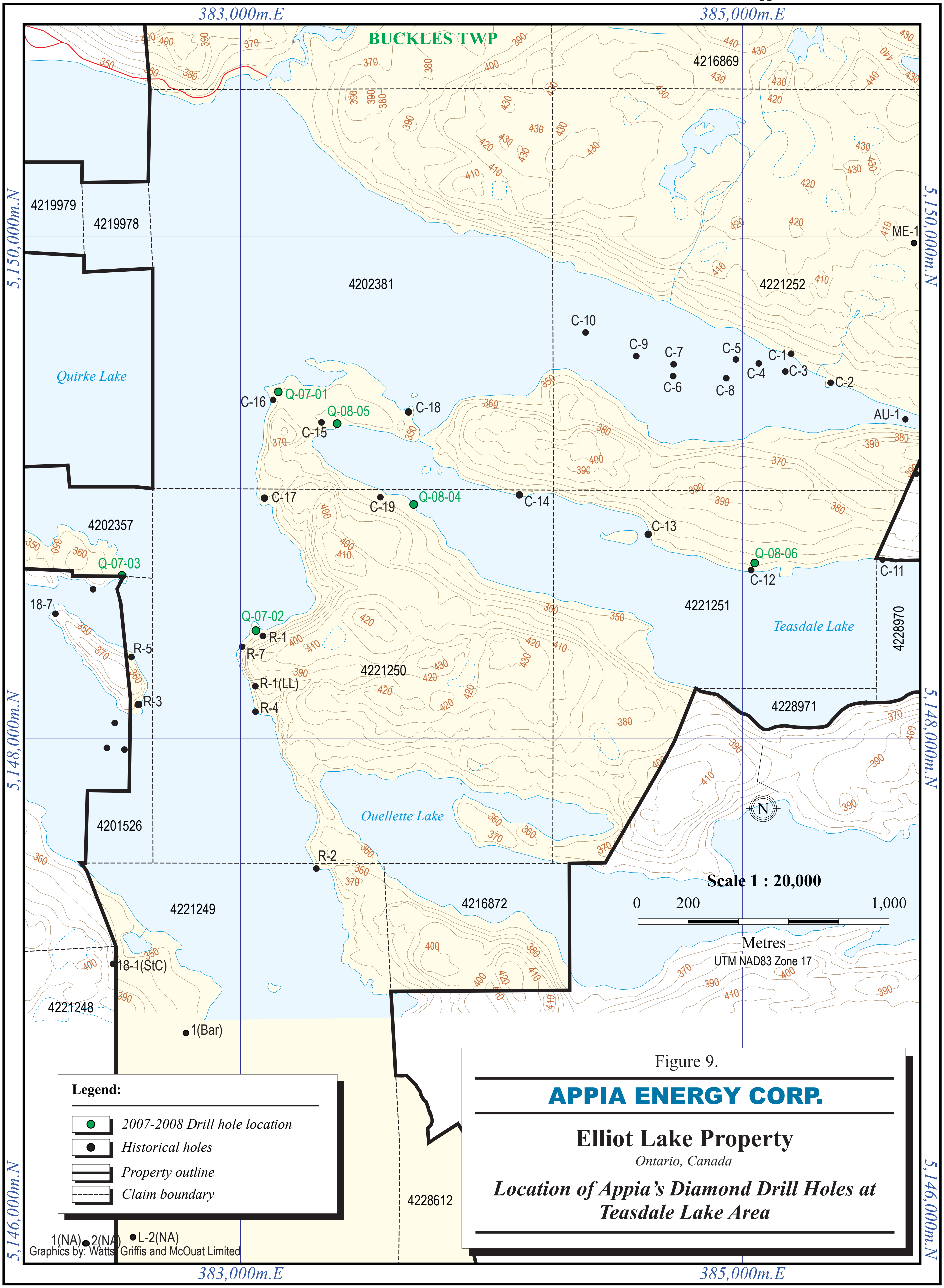
Last revision date: Thursday 1 September 2011

Watts, Griffis and McOuat



10.1.9 Teasdale Drill Hole Q-08-06

Appia drill hole Q-08-06 was collared near the northern shoreline of Teasdale Lake. As the most easterly hole drilled by Appia in the area, it was situated about 1.6 km east of Q-08-04 in the vicinity of historical 1950s-era Conecho hole C-12. Appia was unable to relocate the casing for this hole, however, Mining Recorder records provide sufficient evidence to indicate that the Appia hole must have been relatively close to the older hole. Records indicate that C-12 intersected a 1.5 m thick zone with an average value of 1.23 lbs U_3O_8/ton (0.062% U_3O_8). The Appia hole intersected a uranium-bearing zone from 326.87 to 333.31 m (6.44 m thick) having an average grade of 0.404 lbs U_3O_8/ton (0.02% U_3O_8). A narrower zone and higher grading zone at 331.66-332.26 m (0.60 m) averaging 1.439 lbs U_3O_8/ton may approximate the reported historical result. These results are summarized in Table 13. Pinkish granite basement rock was present in the hole below 361.5 m.

Plate 13: Boart Longyear drill LY 38 drilling above the shore of Teasdale Lake.

10.2 PHASE TWO DRILLING PROGRAM

10.2.1 Summary

Between October and December, 2008, Appia completed two new diamond drill holes and a short wedged hole cut from the latter of the two holes. All of the drilling was completed to test the Banana Lake Zone. In total, 3,109 m (10,200 feet) were drilled in holes BL-08-03, BL-08-04 and BL-08-04-W1. The holes were intended as step out holes to extend the known Banana Lake uranium mineralization in a northerly direction away from those intersections achieved in Appia's 2007-08 Phase One drilling program.

10.2.2 BL-08-03

According to Appia's core logs, the drill hole intersected a relatively thin (8.62 m or 28.3 ft.) Ryan Member at the base of the Stinson Member at 1,507.29m (4,945.2 ft.). The basal Stinson conglomerate rested on 3.21 m of cobble reef followed by 4.94 m of quartzite and then by 0.47 m of pyritic quartz-pebble conglomerate mixed with paleosol resting on basement paleosol [10]. The cobble reef, quartzite and paleosol had average uranium contents of 0.60, 0.20 and 1.37 lbs U_3O_8/ton, respectively. The Pardee, Nordic and Lacnor reefs were either not deposited at this location or, were subsequently eroded or removed during the deposition of the overlying Stinson Member which is extraordinarily thick at 108 m (357'). Twenty-four samples of core were taken for analysis. The best intersections are summarized in Table 13. A narrow higher grading horizon in the quartzite averaged 1.48 lbs U_3O_8/ton over a thickness of 0.55 m (1.80 ft.). Included with its wider lower grading shoulders, the horizon produced an average of 0.60 lbs U_3O_8/ton over a thickness of 3.21 m (10.53 ft.).

10.2.3 BL-08-04

In this Appia drill hole, the Ryan member is a more conventional 31 m (102 ft.) thick, and is overlain by the Stinson basal conglomerate. The hole intersected the hanging wall of the Lacnor Reef at 1,471.52 m (4827.8 ft.). The reef was 4.56 m (14.9 ft.) thick and 38 samples were collected for analysis. The Pardee and Nordic Reefs were not deposited at this location,

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[10] Paleosol, also called regolith, is dark green gray or black silt or mud-like material lying on top of the weathered surface of the Archean unconformity. It is very rare for paleosol to contain significant amounts of uranium.

or if they were present at one time, they were subsequently eroded by the overlying Stinson member which is 68.67 m (225.3 ft.) thick. The sample series spanning the Lacnor Reef has an average grade of 0.85 lbs U_3O_8/ton over a thickness of 8.50 m (27.9 ft.). Additional mineralized sections are presented in Table 14 and shown in Figure 10. The footwall of the Lacnor Reef was intersected at 1,480.02 m (4,855.7 ft.) and the Archean basement was reached at 1,498.39 m (4,915.9 ft.). There were no significant uranium values over economically interesting widths in the cobble beds between the Lacnor Reef and the basement.

Table 14
Uranium-Bearing Intervals in Appia Holes Drilled on the Banana Lake Zone

DDH Name	Interval (metres)			Width	Grade	
	From	To	Width	(Feet)	lbs U_3O_8 / ton	lbs ThO_2 / ton
BL-08-03	1507.29	1510.50	3.21	10.53	0.600	0.09
including	1509.95	1510.50	0.55	1.80	1.484	0.16
BL-08-04	1471.52	1480.02	8.50	27.89	0.853	0.14
including	1471.72	1474.23	2.51	8.24	1.039	0.17
	1475.30	1476.40	1.10	3.61	1.402	0.09
	1477.24	1480.02	2.78	9.12	0.872	0.13
BL-08-04 W1	1472.69	1481.01	8.32	27.30	1.028	0.14
including	1472.69	1475.35	2.66	8.73	1.217	0.18
	1476.25	1479.35	3.10	10.17	1.024	0.14
	1479.71	1481.01	1.30	4.27	1.577	0.17

10.2.4 BL-08-04-W1

This Appia hole was wedged off the initial pilot hole BL-08-4. The purpose of this wedge cut was to have two reef evaluations close to one another thus increasing the confidence level of the results. The geology of the comparable sections are essentially the same. The thickness of the Ryan Member is 31.6 m (103.6 ft.) versus 31 m in the pilot hole. The hanging wall of the Lacnor Reef was intersected at 1,472.69 m (4,831.7 ft.). This point was 4.82 m (15.8 ft.) below the bottom of the Stinson member basal conglomerate. Forty samples were taken for analysis. Over a 8.32 m (27.3 ft.) section spanning the reef, the average uranium content was 1.028 lbs U_3O_8/ton. Other narrower intersections within this zone are presented in Table 14. Given the geometry of the hole and the uranium-bearing horizons, the intersections essentially represent true thicknesses.

The Archean basement was intersected at 1,499.43 m (4,919.4 ft.). As in the pilot hole, no economically significant uranium grades were found in the cobble beds between the Lacnor Reef and the basement.

Plate 14: Boart Longyear drill LY 150 drilling in the Banana Lake area.

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Last revision date: Wednesday 19 July 2011

Watts, Griffis and McOuat

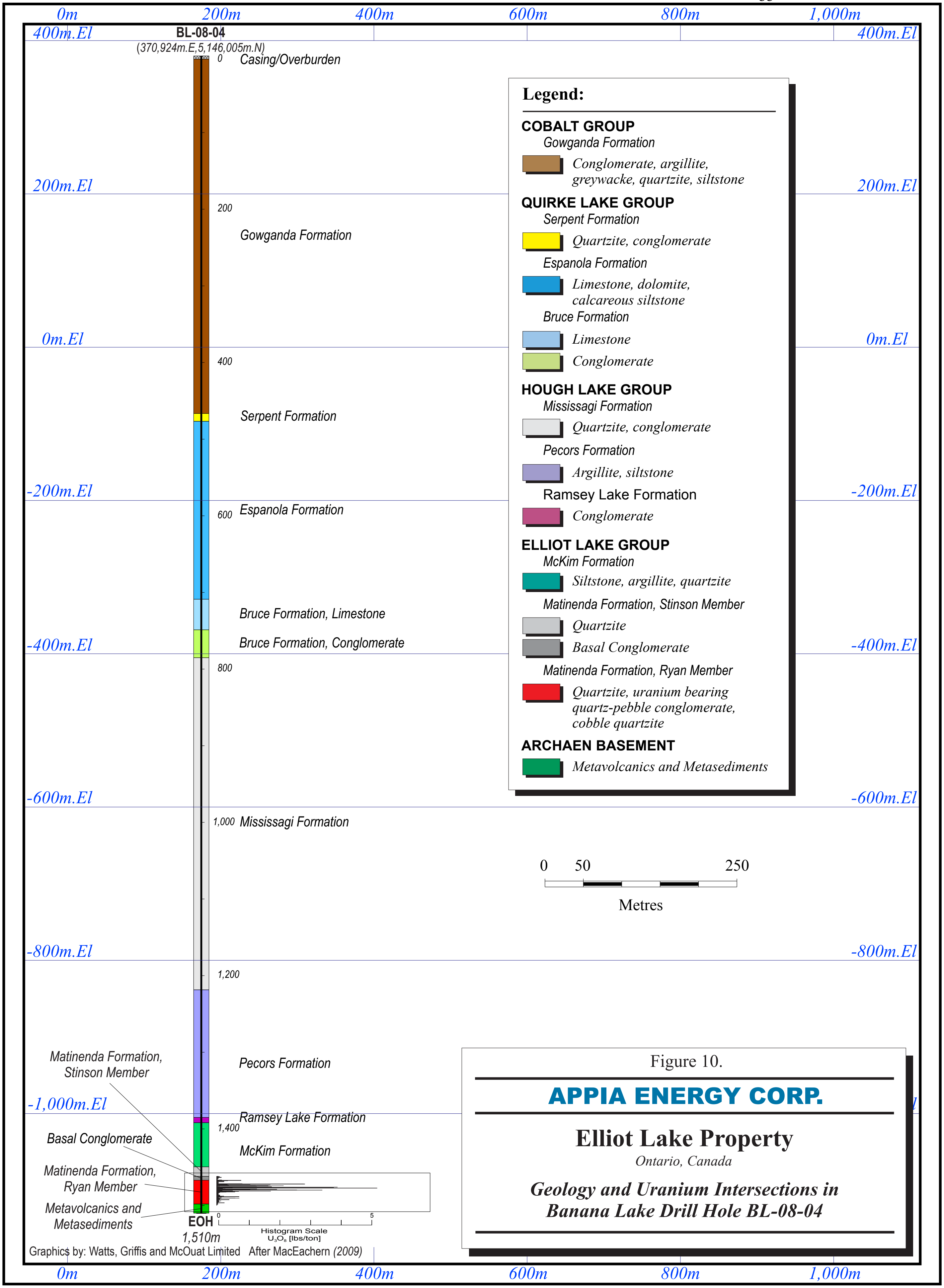

Figure 10.

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Geology and Uranium Intersections in Banana Lake Drill Hole BL-08-04

10.3 DISCUSSION OF DRILLING RESULTS

The Banana Lake and Teasdale drill hole assay results have been previously summarized, respectively, in Tables 10, 11, 12 and 13.

All of the Appia holes completed during the 2007 and 2008 drilling programs intersected uranium-bearing horizons and the grades-thicknesses encountered were more or less the same as those intersections taken from historical records. This is not surprising given the credibility of the companies involved at the time and the relatively uniform and stratabound character of the mineralization. It is vital to understand that the Appia drilling program confirmed the presence of uranium mineralization extending from former mine workings and that these intersections are not therefore in new or un-tested horizons.

According to Mining Recorder assessment records, Kerr McGee carried out a drilling program in the Banana Lake area in the 1950s, ‘60s and ‘70s in an area then referred to as the Gemico #2 block. Three of the boreholes, namely KM-156-5, KM-150-5 and KM-150-2, intersected mineralized horizons. Based on Kerr McGee’s data, Rio Algom’s Chief Geologist (Doug Sprague, P.Eng.) did a resource estimate for the Banana Lake area and concluded that the area had a potential for 175.8 M tons or mineralization with an average grade of 0.76 lbs U_3O_8/ton. This estimate, which herein has been described as historical and non-compliant with NI 43-101, was based on a small group of Kerr McGee drill holes that Rio Algom thought defined an area of uniform mineralization in the deeper basin. These holes were:

DDH	Grade (lbs U_3O_8/ton)	Width (metres)
KM-156-5	0.65	10.4 (34 ft.)
KM-150-5	0.88	13.4 (44 ft.)
KM-150-2	0.68	3.4 (11 ft.)

Appia’s drilling programs in the Banana Lake area successfully confirmed that Kerr McGee’s drill holes KM-150-5 and KM-156-5 did indeed intersected interesting uranium mineralization in quartz-pebble conglomerates over considerable thicknesses. Broad zones of mineralization carry grades between approximately 0.75 lbs and 1.0 lbs U_3O_8/ton while much narrower zones carry substantial grades locally exceeding 5.0 lbs U_3O_8/ton. The drill holes are a great distance apart - the wedged holes completed by Appia on the historical KM-150-5 and KM-156-5 drill sites are 835 m apart. The newer holes drilled from surface by Appia are step-outs of 751 m and 862 m from the Kerr McGee holes used by Appia in its first drilling program as pilot holes. Holes BL-08-03 and ’04 are 685 m apart along a WNW-trending line.

The lateral persistence of uranium in the Elliott Lake conglomerates is well documented and Appia's drilling has corroborated the historical results.

WGM believes that it is likely that potentially interesting uranium mineralization will extend further east-southeast to the vicinity of historical hole KM-150-2. This would extend the total strike length of the mineralized zone to at least 3 kilometres in this area. As concluded by Alan MacEachern, there is a potential for significant tonnage of lower grading uranium mineralization in the Banana Lake Zone. Appia's most recent drilling (BL-08-03, '04 and '04-W1) clearly shows potential for higher grading mineralization to the north and northwest (MacEachern).

WGM is of the opinion that the current drilling by Appia in the Banana Lake Zone has demonstrated sufficient continuity of grade and thickness that it is possible to undertaken a NI 43-101 compliant resource estimate for portions of the mineralized zone. Considerable additional drilling will be required before it will be possible to complete a NI 43-101 compliant resource estimate for the entire zone on the magnitude of Rio Algom's historical estimate, however there exists no evidence at this time that would discredit Rio Algom's interpretation.

Using drill hole data from the 1970s and the 1980s, Doug Sprague, P. Eng., completed a resource estimate in the Teasdale Lake area for Artisan Gold Inc. and this historical record is reported herein [11]. While the result should not be relied upon for investment decisions, and the method of estimation is not seen as complying with current standards, WGM is of the opinion that the Appia drilling has demonstrated that the underlying data is valid and can be relied upon for current use. Panel Mine plans clearly show that the Teasdale Lake Zone is an easterly trending extension of the uranium ore zone(s) in the mine workings. The persistence of uranium mineralization from the mine onto the Appia claims has therefore been proven beyond any reasonable doubt. Based on taking the Appia and historical drilling data at face value, WGM accepts in principle that the Sprague estimate as a reasonable, though non-compliant, expression of the amount of uranium present in the zone presently outlined by diamond drilling over an area of approximately 2.4 km^2. Clearly additional drilling has the potential to increase this resource.

11 The Teasdale Lake Zone was estimated by Sprague to contain a resource of 17.4 million tons at 1.206 lbs U_3O_8/ton. This estimate is historical (see table 4).

In summary, the Appia diamond drilling programs have clearly indicated that the Teasdale and Banana Lake areas have considerable uranium potential. The drilling programs accomplished the following:

- confirmed portions of the historical Kerr McGee Corp. drilled uranium resources as estimated by Doug Sprague, Chief Geologist for Rio Algom;
- identified and delineated the up-channel (closer to source) portions of the Banana Lake Zone which is an extension of the production ore reefs found in five past producing mines that exploited the Nordic Ore Zone;
- increased the U_3O_8 grade compared to the historical estimate in five out of six Appia intersections;
- increased the Lacnor Reef thickness compared to the historical estimate in four out of six Appia intersections with the other two only slightly less than the historical estimate;
- demonstrated that the Lacnor Reef has a low bedding dips and a thickness of 5-9 m (17-28 feet), potentially making it amenable to modern, cost efficient, high production, mining and bioleaching methods;
- established that there is a very good probability that additional diamond drilling could substantially increase the grade and tonnage of the Banana Lake Zone resource in large untested areas to the northwest and southeast of the Appia drill holes;
- demonstrated that the grades reported from the Teasdale Lake Zone are reliable indicators of the uranium mineralization present;
- allowed WGM to confirm the order of magnitude tonnage and grade of the uranium mineralization in the Teasdale Lake Zone as originally estimated by Doug Sprague, Chief Geologist for Rio Algom; and,
- allowed WGM to complete NI 43-101 resource estimates on portions of both the Banana Lake and Teasdale Lake Zones.

11. SAMPLING METHOD AND APPROACH

During the drilling program, uranium-bearing intervals were delineated on the basis of diagnostic radiometric signatures as measured with a hand-held RS-125 Super-SPEC portable gamma ray spectrometer manufactured by Radiation Solutions of Mississauga, Ontario, Canada. The specifications and capabilities of this instrument are described in Section 9.2 of this report. It is important to understand that the equivalent potassium, uranium and thorium data provided by portable spectrometers allow insight into the elemental make-up of a radioactive source, but they do not provide analytical data. Such data can only be reliably provided through conventional analytical means. Equivalent metal data is calculated based on statistical algorithms integral to the instrument's software, and the accuracy of such data is influenced by the manner in which the instrument is used, its performance, ambient conditions and operator experience. Radiometric data was used as a guide in selecting intervals to be sampled.

Appia's 2007-08 drilling program generated 1,158 samples of which 1,105 were regular drill core samples and 53 were QA/QC samples that were inserted into the sample stream. All samples were analysed as batches and the lab was not aware of the QA/QC samples. One of three (DL 1A, UTS-4 and BL-3) standards from CANMET[12] and CDN Labs[13] of Burnaby, B.C. (DL 1A, UTS-4 and BL-3) was inserted into the sample stream. In addition, duplicate samples and one field blank (from barren country rock) were also collected and inserted into the sample stream. Control samples constituted approximately 5% of the samples submitted by Appia. This QA/QC program was in addition to the internal control program carried out by Activation Laboratories ("**Actlabs**"), a fully accredited geochemical laboratory located in Ancaster, Ontario meeting both ISO/IEC 17025 with CAN-P-1579 standards as recommended by the Toronto Stock Exchange-Ontario Securities Commission mineral standards taskforce.

On receiving the samples, Actlabs dried and crushed the entire core sample to a nominal 85% passing a #10 mesh screen, before repeated riffle splitting of the crusher product to generate an aliquot of approximately 250 g. The subsample was then pulverized to a nominal 95% passing a #150 mesh screen using a ring and puck pulverizer. Cleaner (wash) sand was used between each sample to prevent carry-over.

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12 Canada Centre for Mineral and Energy Technology – Energy Mines and Resources Canada; Uranium Tailings Reference Materials.

13 CDN Laboratories Ltd., 10945-B River Road, Delta, B.C., Canada, V4C 2R8; Phone No.: 604-540-2233

The analysis of samples for uranium was primarily by Actlabs' Code 5D which uses neutron activation and delayed neutron counting (DNC). Approximately one gram of sample was weighed into a polyethylene capsule which in turn was sealed into a carrier vial for neutron irradiation within a slowpoke nuclear reactor. The sequentially irradiated samples are transferred automatically to the BF3 counting array detector using a computer automated system. Calibration is achieved with certified reference materials. All elements in the sample absorb neutrons which produce a subsequent emission that can be used to measure the composition of the sample using an array of BF3 neutron detectors. This technique, more generally referred to as neutron activation analysis, is ideal for measuring uranium and many other trace elements from sub-ppm to percentage levels. The method does have limitations as certain interferences can occur. It measures total metal content which may not be relevant in the sense of mineral economics, for example, it measures total uranium rather than soluble uranium. While the difference may be trivial in most geological environments, DNC analysis may include non-recoverable uranium that is contained in the crystal lattice of resistate minerals such as zircon. Samples greater than 1% (10,000 ppm) U are reanalyzed by using a lithium metaborate/tetraborate fusion in platinum crucibles with analysis of the glass bead by XRF. This, again, is a very robust digestion which may report uranium in resistates.

Other elements were determined by Actlabs Code 5 (A & B) by which pulverized sample material is weighed into small polyethylene vials specially fabricated for Actlabs to ensure they have a low background in metallic elements. After the weight is recorded, samples are irradiated with control international reference material CANMET STSD-2 and NiCr flux wires at a thermal neutron flux of 7×10^{12} n/cm^2/s in the McMaster slowpoke reactor. Following a 7-day decay cycle (cooling time) the samples are measured by an Ortec high purity Ge detector with a resolution of 1.67 KeV for the 1332 KeV Cobalt-60 photopeak. The detector is linked to Canberra Series 95 multi-channel counting system and is fully computer automated. Activities for each element are decay and weight corrected and compared to a detector calibration developed from multiple international certified reference materials. STSD-2 is used solely as a control to verify the system is operating properly. Selected samples are re-measured and compared to the original as part of the QA/QC procedure.

A few samples were analysed for gold using an Actlabs Code 1A2 procedure which is a conventional 1050^{o}C fire assay on a 30 g charge with an atomic absorption instrumental finish with a 5 ppb lower detection limit (the upper limit is 3,000 ppb). Samples exceeding the upper limit of 3,000 ppb are reanalyzed using a gravimetric finish in which the prill is weighed.

The second drilling program, carried out during the second half of 2008, employed the same Actlabs' sampling practices and techniques, and essentially the same analytical techniques and protocols. Gold was determined using the same Actlabs' fire assaying code (1A2) with an instrumental AA finish. Uranium was determined using Instrumental Neutron Activation Analysis commonly referred to as INAA. All samples were analysed for a suite of 56 trace and indicator elements (Ag, Al, As, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Hf, Ho, In, K, La, Li, Lu, Mg, Mn, Mo, Na, Nb, Nd, Ni, Pb, Pr, Rb, Re, Sb, Se, Sm, Sn, Sr, Ta, Tb, Te, Th, Tl, Tm, U, V, W, Y, Yb, Zn and Zr) using an Actlabs UltraTrace 5 protocol employing a 4-acid (total) digestion with an instrumental finish employing a mass spectrometer.

WGM's experience from comparative analysis using DNC, INAA and conventional 4-acid digestions has shown that some systemic differences can be expected in the geochemical populations generated by each of these techniques. Data levelling could be a legitimate concern if the Appia exploration program was directed at the detection of subtle anomalies. Aqua regia digestions can produce far greater variances with neutron activation and total digestion techniques. However, in the case of the Appia program, the differences are relatively small and are not significant within the context of an exploration program directed at the testing of known mineralized zones having economically interesting levels of mineralization. The differences in analytical technique between the first and second drilling programs have very limited impact on the overall project database.

12. SAMPLE PREPARATION AND SECURITY

For reasons cited herein, no surface sampling has been carried out by Appia on the Property, and all samples submitted for analysis have been derived from diamond drill core.

Mineralized core intervals were sawn/split in the field, one half was retained in the core tray as an archived record and the other half was placed in a plastic sample bag, sealed and sent for analysis to Activation Laboratories ("**ActLabs**") in Ancaster, Ontario, as mentioned, a fully ISO/IEC 17025 accredited analytical facility. The Appia geologist retained possession of samples until they were delivered to the courier for shipping to the lab.

On receiving the samples, Actlabs crushed the entire core sample to a nominal 85% passing a #10 mesh screen. The sample was riffle split several times until a suitable aliquot of approximately 250 g was separated for pulverizing to a nominal 95% passing a #150 mesh screen using a ring and puck pulverized. Cleaner (wash) sand was used between each sample to prevent carry-over.

The analysis of samples for uranium was primarily by Actlabs Code 5D which uses neutron activation and delayed neutron counting (DNC). Approximately one gram of sample is weighed into a polyethylene capsule which is sealed into a carrier vial for irradiation by the neutron flux produced within a slowpoke nuclear reactor.. Samples are irradiated sequentially for a brief period and then transferred automatically to the BF3 counting array detector using a computer automated transfer system. Calibration is achieved with certified reference materials. All elements in the sample absorb neutrons which produce a subsequent emission that can be used to measure the composition of the sample using an array of BF3 neutron detectors. This technique, more generally referred to as neutron activation analysis, is ideal for measuring uranium and many other trace elements from sub-ppm to percentage levels. The method does have limitations as certain interferences can occur. It measures total metal content which may not be relevant in the sense of mineral economics, for example, it measures total uranium rather than soluble uranium. While the difference may be trivial in most geological environments, DNC analysis may include non-recoverable uranium that is contained in the crystal lattice of resistate minerals such as zircon. Samples greater than 1% (10,000 ppm) U are reanalyzed by using a lithium metaborate/tetraborate fusion in platinum crucibles with analysis of the glass bead by XRF. This, again, is a very robust digestion which may report uranium in resistates.

Other elements were determined by Actlabs Code 5 (A & B) by which pulverized sample material is weighed into small polyethylene vials specially fabricated for Actlabs to ensure they have a low background in metallic elements. After the weight is recorded, samples are irradiated with control international reference material CANMET STSD-2 and NiCr flux wires at a thermal neutron flux of 7 x 10^{12} n/cm^2/s in the McMaster slowpoke reactor. Following a 7-day decay cycle (cooling time) the samples are measured by an Ortec high purity Ge detector with a resolution of 1.67 KeV for the 1332 KeV Cobalt-60 photo-peak. The detector is linked to Canberra Series 95 multi-channel counting system and is fully computer automated. Activities for each element are decay and weight corrected and compared to a detector calibration developed from multiple international certified reference materials. STSD-2 is used solely as a control to verify the system is operating properly. Selected samples are re-measured and compared to the original as part of the QA/QC procedure.

A few samples were analysed for gold using an Actlabs Code 1A2 procedure which is a conventional 1050^{o}C fire assay on a 30 g charge with an atomic absorption instrumental finish with a 5 ppb lower detection limit (the upper limit is 3,000 ppb). Samples exceeding the upper limit of 3,000 ppb are reanalyzed using a gravimetric finish in which the prill is weighed.

In order to ensure that QA/QC protocols are followed, a system of blank and standard samples was implemented. All drill holes were surveyed with down-hole logging equipment including a spectrometer to ensure that assay intervals were confirmed and accurately reported.

All the split cores are currently being stored in core racks that are inside a locked building in the town of Elliot Lake. The un-split cores are being stored outside the building, cross-stacked, in a fenced area. Sample intervals from the drill program are permanently recorded in drill logs combined with the assay results.

13. DATA CORROBORATION

13.1 OVERVIEW

The WGM geologist used a Garmin 76MAP GPS instrument to audit the locations of selected mine infrastructure and drill holes reported in this document. Processing used the GPS Utility (Version 4.02.4) software available as freeware from Alan Murphy's website at http://www.gpsu.co.uk. WGM uses a licensed up-grade of this software which permits the handling of large data sets.

The WGS-84 datum, the international default datum for mid-latitude regions, was used to provide all measurements. The MNDM uses the NAD-27 (Canada) datum for its records of drill hole locations stored in its ERMES database, and so all WGM measurements were also recorded in NAD-27 (Canada). The physical difference in co-ordinates between the two datums was 3-5 metres as measured on the ground. The GPS Utility software converted between the two datums and between geographic co-ordinates and UTM co-ordinates with no significant variance after the data is discounted for the estimated position error.

WGM found the MNDM co-ordinates for previously drilled holes to be inaccurate, even allowing for any reasonable degree of GPS error. Differences between plotted positions shown in the Mining Recorder's assessment records and the actual locations varied by 155 to 330 metres. WGM understands that the recorded co-ordinates were measured from existing maps, and that these maps are imprecise. WGM also found that the graphical locations shown on sketch maps that accompanied the drill hole logs filed by Kerr McGee Corp. were reasonably accurate. Some diligence was required on the ground to ensure that the correct geographic features were being used, and this was not always easy given the 30 years of forest growth had occurred since many of the holes had been completed.

Due to the nature of the previous deep drilling and sampling programs, little of the historical core was available for inspection at the core library, and none of it was available for check sampling.

WGM confirmed the location of Banana Lake drill hole BL-08-02 which is located at 46° 27' 18.4" north latitude and 82° 41' 56.8" west longitude (UTM Zone 17T 369518E 5146020N) using position averaging over a 5-minute count (300 readings). The hole was completed at an elevation of approximately 391 metres. The estimated range of error on the GPS was 1.9 m. at an elevation of 391 m. Appia's reported UTM location was 369519E and 5146032N, a difference of approximately 12 m and within the overlapping spheres generated talking into account estimated position errors. The WGM location was based on the instrumentally generated average of repeated GPS measurements measured automatically every second over a 5-minute interval with an estimated position error or two metres. The WGM procedure for measuring the location was more precise than that used by Appia during the initial drilling program carried out in 2007-08. The fact that Appia used the NAD-27 datum and WGM used the WGS-84 datum was shown to have negligible affect in accounting for any differences in location.

13.2 BEDROCK SAMPLING

As mentioned in the foregoing text, the mineralized conglomerates in the Matinenda Formation rarely outcrop and do not outcrop on the Appia property. No amount of surface sampling can provide Appia with the answers that it requires in respect to the deep uranium-bearing conglomerates that have been intersected previously in the project area.

Prior to the 2007-08 drilling program, no recent sampling work had been carried out on the Appia Property, and so during its site visit WGM was not able to observe any such work being completed. Nevertheless, it is WGM's view that no amount of surface sampling carried out at the time of its site visit or in the future could provide useful information in respect to confirming the deep mineralization known to exist on the Property.

Appia followed WGM's recommendation for a program of deep drilling using the previous drill holes as a cost-effective means of quickly placing a wedge at a depth of 1,000-1,300 m. New holes were wedged off the original hole in such a way as to provide new drill core from the uranium-bearing conglomerates below the depth of the wedge. Rather than providing a twinned sample point, the intent of this drilling was to maximize hole deflection off the wedge and below, and thereby provide additional sampling points at a maximum possible distance from the original hole. Therefore, the new Appia assay data was not expected to precisely match that of the historical intersections. Appia's analysis of the new core essentially confirmed the earlier results although grades and thicknesses were somewhat different as discussed in the diamond drilling section of this report. Appia's second drilling program resulted in the drilling of two step-out holes which also corroborated the geological model and the anticipated potential for uranium resources in the Banana Lake Zone.

Appia also followed Appia followed WGM's recommendation for a drilling program intended to corroborate some of the historical drill holes in the Teasdale Lake Zone. The Appia holes were positioned as close as possible to the casing marking the collars of the historical holes, and drilled at the same vertical orientation as the original holes. Allowing for some variations attributable to sample interval selection, the new Appia assay data was expected to duplicate that of the historical intersections. Some variations were encountered which are discussed in the diamond drilling section of this report, however no variations were found such that mineralization was absent were formerly reported. In addition, the thicknesses of the mineralized zones were comparable.

As mentioned in the foregoing text, no amount of surface sampling will provide Appia with the answers that it requires in respect to the deep uranium-bearing conglomerates that have been intersected previously in the project area.

13.3 EVALUATION OF LABORATORY PERFORMANCE

Given the historical nature of the previous exploration work, WGM did not attempt to determine which laboratories were used previously.

The WGM geologist and QP, Al Workman, P.Geo., was active in the uranium industry during the period 1975-1982, and believes that the existing laboratories at the time were very capable of producing high quality analytical data for uranium and thorium. In addition to laboratories such as the Technical Services Laboratory and the X-Ray Assay Laboratory "**XRAL**" (now SGS-Lakefield) in Toronto and the Barringer Laboratory in Mississauga, both Actlabs in Ancaster and XRAL were providing neutron activation analysis through the use of the Slowpoke reactor at McMaster University in Hamilton, Ontario. Detection limits at that time were commonly in the range of 1-2 ppm uranium. WGM has no way of determining the precision with which the uranium contents were determined for historically analysed drill core.

WGM reviewed the results of Appia's quality assurance/quality control ("**QA/QC**") program carried out during the recent diamond drilling and noted the following four failures of standards:

Hole ID	ActLabs' File No.	Sample No.	Standard	Uranium Assay (ppm)	
				Actlabs	Certified Value
Q-08-04	A08-0423	32896	Std. DL 1A	21	116
BL-08-02-W1	A08-0915	A 160300	Std. DL 1A	140	116
Q-08-04	A08-0423	32923	Std. UTS-4	870	1,011.5
BL-08-02-W1	A08-0915	A 160290	Std. UTS-4	1,210	1,011.5

Appia noted that most industrial standards were reported to have uranium contents close to the accepted values. Appia averaged the test results on these standards, and again noted that the average of all determinations was very close to the accepted assay. WGM reviewed the data and noted the foregoing assays of standards that fell outside of what WGM would accept as a normal range of values. Actlab's internal checks that were inserted at the time of analysis performed well, so it is possible that the failures represent anomalies within the standard (as unlikely as that may seem). These findings were discussed with the initial Appia project geologist, Sonny Bernales, and it was agreed that additional tests would be made in the future on any samples associated with unusual assays of such standards.

13.4 WGM CHECK SAMPLING

WGM collected a set of check samples during its site visit in June 2008. These samples were submitted to Activation Laboratories in Ancaster, Ontario for analysis. In order to investigate the impact that analytical technique might have on the reported assay, WGM requested that each sample be analysed using three techniques: (1) a delayed neutron count (DNC) determination that duplicates the original analytical procedure and reports total uranium; (2) a multi-element analysis by instrumental neutron activation analysis (INAA) that reports total uranium; and, (3) a mass spectrometer analysis of the sample following a moderate acid digestion using aqua regia to liberate easily leachable uranium. The results of this testwork is summarized in Table 15.

The results of WGM's check sampling are illustrated in Figure 11 as follows. The X-axis is deliberately stretched to allow greater spatial separation in the three WGM assays.

WGM Assays vs Original Assays

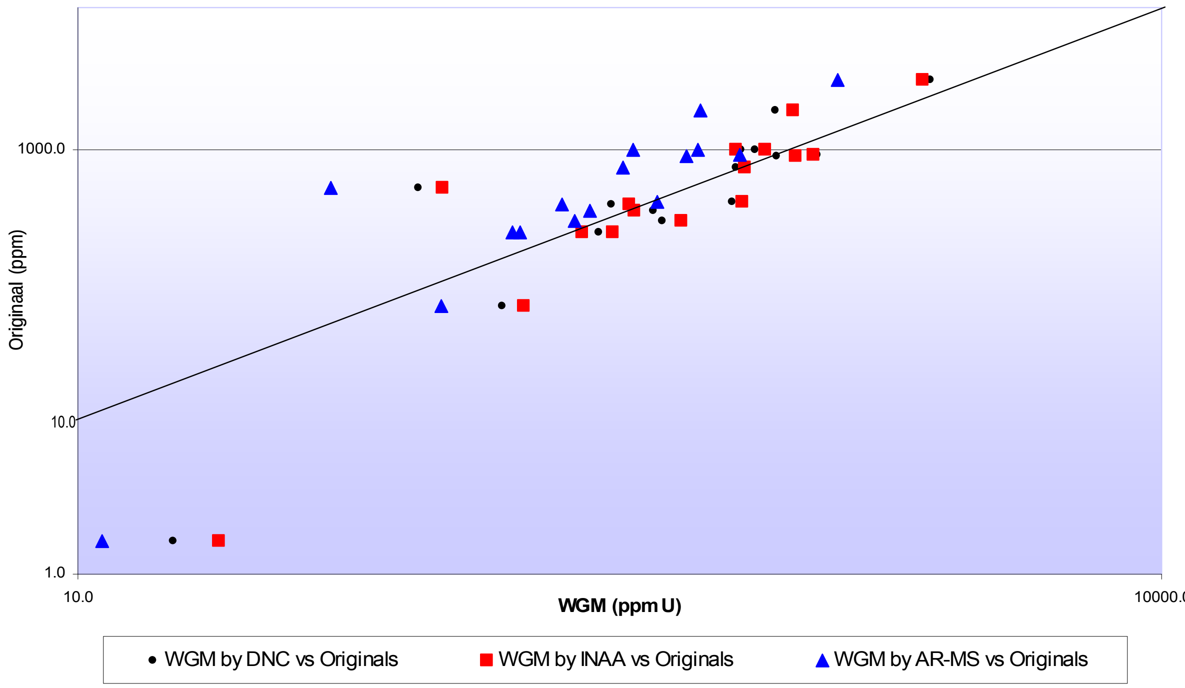


Figure 11: Results of WGM's Use of Various Analytical Methods to Corroborate Appia's Analytical Data

In general WGM's numbers from check samples for lower grading samples are higher than the originals, and the high grade originals came back lower in WGM's checks. The duplicate samples analyzed by the DNC method (same as Appia) show a moderate variance in uranium results as compared to the original values. Analysis by INAA seems to have produced data for most samples that is closest to the original values. The use of an aqua regia extraction combined with an instrumental mass spectrometer finish predictably produced significantly lower grades in the WGM samples than in the original assays. WGM believes that this is due to incomplete sample digestion in a moderately acidic medium. Clearly, a stronger leachate is required to fully liberate the uranium from the sample, but this usefully does illustrate the fact that analytical techniques involving irradiation result in total uranium being reported and this can produce very different results than acid extraction techniques. The differences cannot be explained by laboratory error as Actlabs internal check samples produced acceptable results.

Table 15
Results of WGM Check Assaying of Appia Diamond Drill Core, Banana Lake and Teasdale Lake Zones

WGM Sample Number	Sample Location			Zone Sampled	WGM Check Assays						Original Assays			Variance		
	Drill Hole	From (m)	To (m)		U ppm	U_3O_8 lbs/ton	U ppm	U_3O_8 lbs/ton	U ppm	U_3O_8 lbs/ton	Sample #	U ppm	U_3O_8 lbs/ton	WGM Assay as a % of Original		
					DNC [1]		INAA [2]		AR-MS [3]			DNC		DNC	NAA	AR-MS
160535	Q-08-05	295.64	295.90	Banana Lake Zone	254	0.60	249	0.59	167	0.39	32947	260	0.613	-2%	-4%	-36%
160536	Q-08-05	296.93	297.63	Banana Lake Zone	391	0.92	347	0.82	262	0.62	32953	365	0.861	7%	-5%	-28%
160537	Q-08-05	302.09	302.56	Banana Lake Zone	752	1.77	801	1.89	521	1.23	32976	994	2.344	-24%	-19%	-48%
160538	BL-08-02 -2nd wedge	1456.77	1456.90	Main Nordic Reef	666	1.57	702	1.66	322	0.76	160400	740	1.745	-10%	-5%	-56%
160539	BL-08-02 -2nd wedge	1456.90	1457.07	Main Nordic Reef	149	0.35	172	0.41	101	0.24	160401	78	0.183	92%	122%	30%
160540	BL-08-02 -2nd wedge	1457.07	1457.27	Main Nordic Reef	1110	2.62	1090	2.57	678	1.60	160402	910	2.146	22%	20%	-25%
160541	BL-08-02 -2nd wedge	1463.71	1463.97	Lacnor Reef	650	1.53	692	1.63	400	0.94	160414	428	1.009	52%	62%	-6%
160542	BL-08-02 -2nd wedge	1463.97	1464.11	Lacnor Reef	277	0.65	303	0.71	159	0.38	160415	259	0.611	7%	17%	-39%
160543	BL-08-02 -2nd wedge	1464.11	1464.21	Lacnor Reef	855	2.02	957	2.26	527	1.24	160416	1860	4.387	-54%	-49%	-72%
160544	BL-08-02 -2nd wedge	1464.21	1464.41	Lacnor Reef	415	0.98	468	1.10	237	0.56	160417	313	0.738	33%	50%	-24%
160545	BL-08-02 -2nd wedge	1464.41	1464.80	Lacnor Reef	863	2.04	967	2.28	485	1.14	160418	892	2.104	-3%	8%	-46%
160546	BL-08-02 -2nd wedge	1464.80	1464.90	Lacnor Reef	301	0.71	337	0.79	219	0.52	160419	404	0.953	-25%	-17%	-46%
160547	BL-08-02 -2nd wedge	1464.90	1465.07	Lacnor Reef	87.9	0.21	102	0.24	50	0.12	160420	534	1.259	-84%	-81%	-91%
160548	BL-08-02 -2nd wedge	1465.07	1465.17	Lacnor Reef	683	1.61	662	1.56	345	0.81	160421	991	2.337	-31%	-33%	-65%
160549	BL-08-02 -2nd wedge	1465.17	1465.77	Lacnor Reef	18.3	0.04	25	0.06	12	0.03	160501	2	0.004	979%	1351%	590%
160550	BL-08-02 -2nd wedge	1465.77	1465.90	Lacnor Reef	2290	5.40	2180	5.14	1270	3.00	160422	3069	7.241	-25%	-29%	-59%

Notes re sample analysis: (1) DNC – delayed neutron counting; (2) INN – instrumental neutron activation analysis; (3) AR-MS – digestion by aqua regia followed by instrumental mass spectrometer finish.

It is interesting that variances within the WGM duplicates also affect iron and other elements that might be associated with pyrite and uranium (rare earths). WGM believes this may be attributable to incomplete homogenization of the check samples in respect to pyrite and other heavy minerals. As a result, charges from the same pulp may have varied in mineral composition. This effect would be acerbated in the case of a small charge which is precisely what DNC uses. A recent paper by Brooks (2008) underscores the need for caution in the preparation of rock samples for analysis for uranium. Uranium mineralization tends to occur as brittle, heavy mineral grains (some microscopic) that may be difficult to properly homogenize within granular sediments or pulped samples. Care is required in sample preparation and any process involving the subdivision of samples as the slightest vibration can result in the settlement of heavy mineral particles.

As far as the WGM data and the original data is concerned, the solvent extraction process produced the best results at grades below 200 ppm and DNC may be best above that threshold (see graph). WGM cannot easily explain the general sense that the original samples are higher grading. Possible explanations include selective sampling, but the mineralization is not generally known to be nuggety or patchy to the extent that selective sampling would be possible. During its site visit, WGM noted that the core was not marked with a cutting line prior to sawing, and as a result the cut has not been made consistently along the drill core with respect to the bedding angle. The randomness of the half being analyzed is unfortunate, and greater care should be taken in the future that core is sawn along a plane normal to bedding (or foliations). The original sample was half-core whereas the WGM sample was quarter-core, and this might have some influence on the quality of the data produced although many statisticians will argue otherwise. It has been WGM's experience that larger samples are always preferred assuming that complete homogenization is possible and actually achieved. WGM recommends that a selected set of original rejects be reanalyzed to provide new comparative data for 10% of the sample population.

14. ADJACENT PROPERTIES

Under NI 43-101 and in the context of this report, an "Adjacent Property" is a mineral property with a boundary reasonably close to the boundary of the Appia Elliot Lake area property.

An adjacent exploration property is held by Pele Mountain Resources Inc. ("**Pele**") of Toronto, Canada. The Pele property comprises a 100-percent interest in 313 mining claims covering more than 12,500 acres near Elliot Lake and covering portions of Rio Algom's past-producing Lacnor Mine property where the Pardee reef was identified. Pele has recently referred to this as its Eco Ridge Mine Uranium Project ("**Eco Ridge Project**"). Pele's ownership is held via its wholly owned subsidiary, First Canadian Uranium Inc. ("**FCU**"), and is subject to a 1.75% net smelter royalty that is owned by CanAlaska Uranium Ltd. on the Pardee Claim Group, of which Pele may buy back 1-percent for $1-million. The location of the Eco Ridge Project is shown in Figure 11.

The Pele property has been extensively drilled with more than 100 historic drill holes completed since 1953 by a number of companies including McIntyre Porcupine Mines Ltd. which was the initial discoverer of uranium mineralization in this area on claims it had optioned from Aquarius Porcupine Mines Ltd. Aquarius subsequently constructed a 30-metre adit for sampling purposes. New Jersey Zinc Exploration Co. also drilled a few holes in the area as did St. Mary's Uranium Mines Limited, Stancan Uranium Corp., Algom Uranium Mines and many others. The data was compiled by Rio Algom in 1977 after it acquired the exploration rights to this area. Pele completed a single 224 m hole during 2006.

Based essentially on the historical work, Scott Wilson Roscoe Postle Associates Inc. ("**SW-RPA**") released a NI 43-101 compliant report dated 15 January, 2007 (available on SEDAR) for the property which contained a mineral resource estimate that totalled 30.05 Mt grading 0.05% U_3O_8, in the Inferred Mineral Resource category for a total inferred uranium content of 33.05 Mlbs of U_3O_8.

SW-RPA completed a Preliminary Assessment during late 2007 and its report entitled "Preliminary Assessment on the Elliot Lake Project, Ontario, Canada Prepared for Pele Mountain Resources Inc." by Cochrane et al (2007) and dated 3 October, 2007 was filed on SEDAR. Under NI 43-101, feasibility studies are not allowed on Inferred Resources, however a company may complete a Preliminary Assessment which is defined as an economic analysis carried out to investigate the potential viability of mineral resources at an early stage in a project. Also known as "Scoping Studies", reviews such as these can answer questions concerning the need for a project to discover additional resources at the same grade, or alternatively, whether the company requires higher grading resources to meet viability criteria. The SW-RPA study was based on the previously estimated mineral resources (0.030% U_3O_8 cut-off grade, 2.70 specific gravity), 10% dilution, a US $55.00 per pound U_3O_8 commodity price and an exchange rate of C$1.00 to US$0.90 (Cochrane et al, 2007). The mining method selected was based on a combination of panel drifting and horizontal long-hole slashing with approximately 60% of the ore treated in place by underground bioleaching and 40% of the ore hauled to surface by ramp for conventional milling and treatment in an acid-leach plant. A 3,214 tonne per day production rate was used in the study with ore averaging 0.045% U_3O_8 over an 18 year mine life. Uranium recovery was assumed to be 90% by conventional milling and 70% by bioleaching. The study concluded:

- capital costs related to project development would be C$195 million;
- on-going capital costs would add another C$63 million over the 20-year life of the project, including the rehabilitation period);
- operating costs per pound of U_3O_8 produced over the life of the project would be US$55.51;
- costs associated with decommissioning would total C$31 million;
- based on a commodity price of US $95.00 per pound of U_3O_8, the project generated gross revenue of C1.5 billion and had a net present value ("**NPV**") of C$363.5 million using a zero discount rate and C$41 million using a 10% discount rate, both before taxes;
- at the 10% discount rate, the project had a pre-tax internal rate of return ("**IRR**") of 13%; and,
- a US$5 increase in the commodity price would increase the IRR to 15%.

SW-RPA recommended that Pele increase the density of drilling using a maximum 200 m by 200 m hole spacing which was chosen as sufficient to increase the confidence level of the mineral resources and allow Inferred Resources to be converted to Indicated Resources, and thus able to support a feasibility study.

Based on recommendations from SW-RPA, Pele completed follow-up drilling during late 2007 and early 2008 which expanded a "higher grading" zone within the deposit. Pele's press release on the subject dated 25 January 2008 reported uranium grades ranging from 0.034% U_3O_8 (0.68 lbs U_3O_8/ton) over an estimated true width of 2.20 m to a high of 0.080% U_3O_8 (1.60 lbs U_3O_8/ton) over an estimated true width of 2.66 m. The two widest intersections were both estimated at 2.92 m true thickness and these had uranium oxide contents of 0.060% and 0.070%, respectively (1.20 and 1.40 lbs U_3O_8/ton). In the same press release, Pele updated its Elliot Lake uranium resources to 6.3 Mt of Indicated Resources averaging 0.051% U_3O_8 and 41.0 Mt of Inferred Resources averaging 0.044% U_3O_8 for a total contained resource of "42 million pounds of NI 43-101 compliant U_3O_8 resources". WGM cautions that the adding of inferred and indicated resources is not allowed under NI 43-101 rules and CIM Standards and Guidelines, nevertheless the numbers do show the magnitude of the potential resources on the Pele's Elliot Lake claims. An additional press release on 6 March, 2008 showed additional intersections having the same tenor of mineralization as those holes released previously.

On 1 May 2008, Pele announced that it would initiate a preliminary feasibility study based on the positive results of its scoping study. A subsequent MD&A document completed on 27 May 2008 and filed on SEDAR, provides a summary of the SW-RPA scoping study and reiterates that the sufficient resources were found to support an 18-year mine life producing 826,000 lbs of U_3O_8 per year at a cash operating cost of US $55.51 per pound.

Pele has recently initiated site characterization studies base line environmental studies in preparation for undertaking a Environmental Impact Assessment. Discussions centering on advancing the project towards development are on-going with the Canadian Nuclear Safety Commission, the town of Elliot Lake and Serpent River First Nation representatives.

On 9 September, 2008 Pele announced that it had submitted the project description for its now named Eco Ridge Mine at Elliot Lake to the federal government's major projects management office and the Canadian Nuclear Safety Commission (CNSC). This move initiated the official permitting process for Pele's planned uranium mine and processing facility to be located near Elliot Lake. Pele plans for mining, processing and waste management to make innovative use of proven technologies to build a new facility that will be significantly more advanced and environmentally-friendly than historic operations in the Elliot Lake region. Mining will be accomplished using ramps from surface, trackless development and long-hole slashing. Underground leach cells and surface heap leach cells will be designed to fully contain the leach solutions and to allow for progressive decommissioning. The news release states that no tailings pond will be required at the Eco Ridge Mine. The project description provided target dates for completion of the licensing and permitting activities by year-end 2010, the beginning of construction in early-2011 and the commencement of uranium production in late-2012.

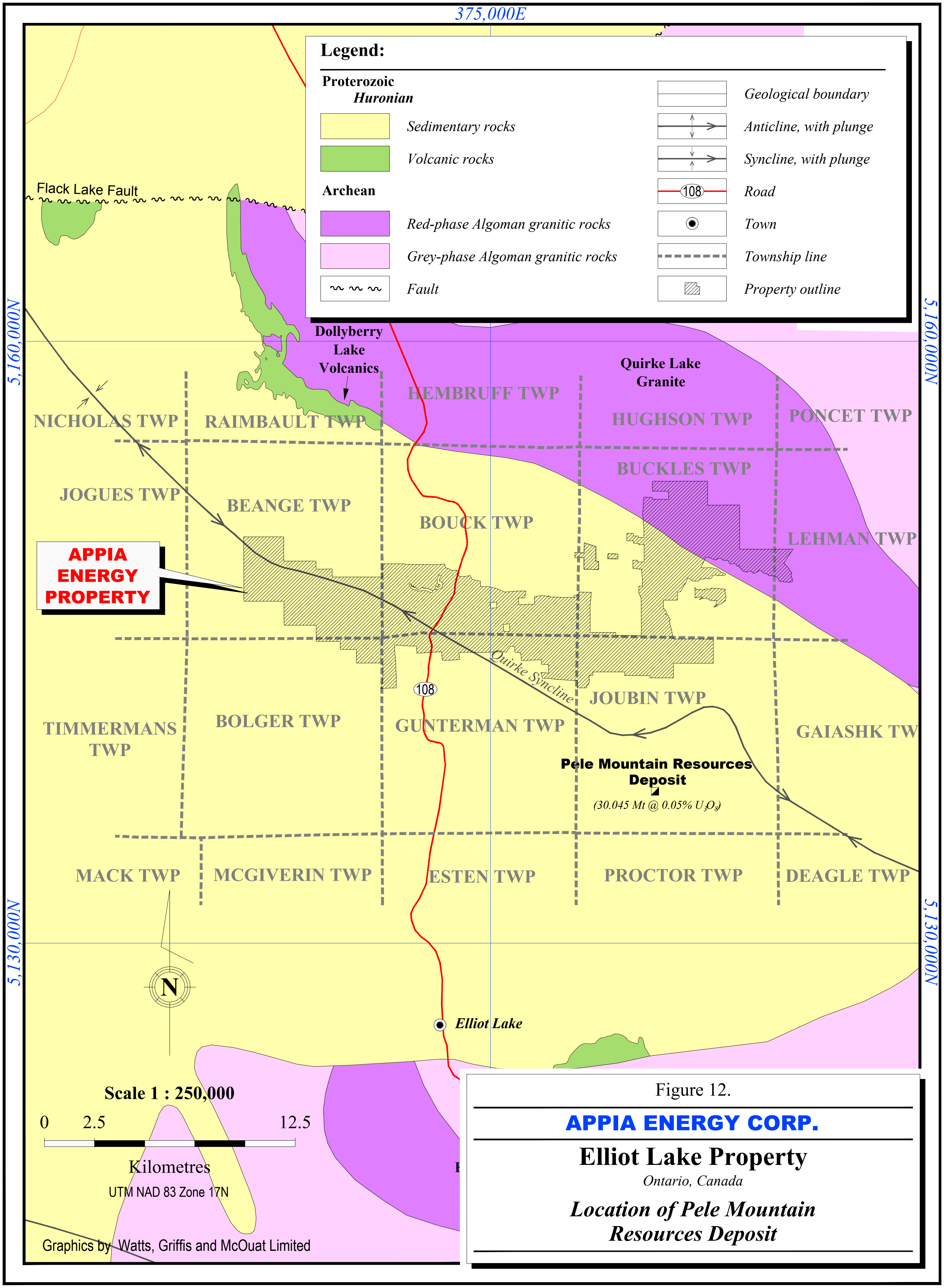


Figure 12.

APPIA ENERGY CORP.

Elliot Lake Property

Ontario, Canada

Location of Pele Mountain Resources Deposit

A follow-up press release on October 28, 2008, announced measures in response to market conditions, including postponement of the pre-feasibility study and certain components of the permitting process. Pele proposed underground uranium mining with uranium processing through a combination of underground bioleaching and surface heap leach extraction at the Eco Ridge Project. Under Pele's plan, approximately 35% of mined ore would be trucked to surface for heap leaching.

A recent Pele new release dated 27 July, 2009 refers to the project containing "a NI 43-101 compliant resource of 6.4 million pounds of "indicated" U_3O_8 (5.68 million tonnes grading 0.051-percent U_3O_8) and 36.1 million pounds of "inferred" U_3O_8 (37.26 tonnes grading 0.044-percent U_3O_8) with the potential for significant expansion." These grades are equivalent to 1.02 lbs U_3O_8 per ton in the Indicated Resources class and 0.88 lbs U_3O_8 per ton in the Inferred Resources class.

During July, 2009, FCU signed an agreement with the City of Elliot Lake in respect to the purchase of the surface rights to a key group of 48 patented mining claims (796 ha) that are part of the Eco Ridge Project. The surface rights covered by the Lease include areas planned for mine portals and other surface plant, equipment and related infrastructure.

On 7 October, 2009 Pele announced new Rare Earth Element ("**REE**") analytical data from selected drill intersections confirming the widespread presence of REE mineralization with the uranium at its Eco Ridge Mine uranium project. As is known from historical records, the Elliot Lake mines were historical producers of significant amounts of yttrium as a by-product of uranium production. The mineralization was prevalent within the uranium-bearing conglomerates. The average leach extraction of heavy REEs plus yttrium averaged 64%, and Pele concluded that these are sufficiently recoverable to add to the economic value of the uranium resources.

This Eco Ridge resource estimate was up-dated in a report dated 5 April, 2011 by RPA, formerly known as SW-RPA, that the deposit contained Indicated Resources of 14.31 Mt grading 0.048% U_3O_8 (0.96 lbs U_3O_8 per ton) and 0.164% total rare earth elements ("**REE**"s) or 3.28 lbs/ton with additional Inferred Resources of 33.12 Mt grading 0.043% U_3O_8 (0.86 lbs U_3O_8 per ton) and 0.132% total REEs or 2.64 lbs/ton (Ciuculescu, 2011). The total contained metal was 15.2 million pounds of U_3O_8 and 51.9 Mlbs of REEs in the Indicated category and 31.4 Mlbs of U_3O_8 and 96.4 Mlbs of REEs in the Inferred category. The resources were based on a cut-off grade of 0.028% U_3O_8 and a long term uranium price of $60 per pound of uranium oxide (the current price is stable at $68).

During July, 2011, Pele announced the results of a new Preliminary Assessment for the Eco Ridge Project, including the following key findings based on a 9,400-tonne per day operation with life-of-mine production of 10.7 Mlbs of total rare earth oxides (REOs) and 24.9 Mlbs of U_3O_8 over a 14-year mine life:

- cumulative operating cash flow of US$1.72-billion
- cumulative pre-tax cash flow of US$1.31-billion
- operating cash cost of US $16 per pound U_3O_8, net of REO credits
- start-up capital costs of US $212 million and sustaining capital costs of US $195 million.
- positive NPV of $533 million (at a 10% discount rate)
- internal rate of return (IRR) of 47 percent (47%)

On the basis of the foregoing analysis by RPA's technical staff, there is no question that with the right market fundamentals, the remaining uranium-REE deposits in the Elliot Lake basin represent a viable long term source of the metals that can be extracted with a very robust rate of return on investment.

15. MINING

15.1 OVERVIEW OF ELLIOT LAKE REGIONAL OPERATIONS

No uranium mines are presently active in the Elliot Lake area.

Further to the east, the Ursa Major Resources ("**Ursa**") Shakespeare Project is advancing towards open pit nickel production. The project is located very near the former Agnew Lake uranium mine, and about 70 km west of Sudbury, Ontario. Ursa completed a full feasibility study on an open pit mine and 4,500 tonne per day concentrator for its project in January, 2006. Ursa received a positive result and base metal prices have been strong since that time. Assuming 2005 average metal prices for the Shakespeare project mine life, including nickel at US$6.59/lb, copper at US$1.65/lb and platinum at US$897/oz, the after-tax internal rate of return is 22.9% and net present value of the project, discounted at 10%, is $50.7 million after tax.

On 21 March, 2007 Ursa announced the selection of a contractor to carry out the excavation, crushing and haulage of a 50,000 tonne bulk ore sample from the Shakespeare nickel deposit. The ore will be hauled for processing to Xstrata Nickel's Strathcona Mill located at Sudbury.

Ursa is presently completing road upgrades to the Shakespeare site to facilitate truck access for hauling the bulk sample. The regulatory approvals granted by the Ontario Ministry of Northern Development and Mines for the removal of a 10,000 tonne bulk sample are being amended to permit the extraction of a 50,000 tonne sample. The company will proceed with mining as soon as the road upgrade is completed and the new regulatory approval for the 50,000 tonne sample is obtained. The company plans to complete the excavation and haulage in the second quarter of 2007.

15.2 FUTURE OPERATIONS ON THE APPIA PROPERTY

Although it is premature to speculate concerning future mine development on the Appia claims, it is certain that any potential mine development would be as an underground operation. The history of mine development in the Elliot Lake camp strongly suggests that the mining method would be room and pillar, or some modified version of this method.

16. MINERAL PROCESSING AND METALLURGICAL TESTING

16.1 BACKGROUND

No substantive metallurgical research on mineral processing to determine uranium recovery parameters has been carried out since the last of the Elliot Lake mines closed in 1996. Notwithstanding this fact, the efficient recovery of uranium was well established at the time of closure. Over the many years that the mines operated, uranium recoveries averaged approximately 95% even while head grades declined from 2-3 lbs U_3O_8/ton (1-1.5 kg U_3O_8/tonne) to 1.6 lbs U_3O_8/ton (0.8 kg U_3O_8/tonne). Recoveries were certainly assisted by the occurrence of the economic minerals as discrete subhedral-to-euhedral grains, although some uraninite grains experienced intergrowth with U-Th silicates.

The Denison Mine was the first to apply bio-leaching, a relatively new technology in 1987 when it was introduced. That year the mine recovered 840,000 lbs (380,952 kg) of U_3O_8 by in-stope bacterial leaching (tonnage under leach not reported). Recoveries were certainly facilitated by the simple mineralogy of the ores: brannerite ($U_xTh_{1-x}Ti_2O_6$), uraninite (UO_2) and monazite ($[U,REE]PO_4$). Coffinite ($[U,Th]SiO_4$) and uranothorite ($[Th,U]SiO_4$), though present, are less important ore minerals. Both brannerite and uraninite are high-uranium minerals in their pure uranium end-members, the former containing 62.8% UO_2 and the latter being pure uranium oxide less any daughter products. Data presented by Robertson (1981) shows that the U:Th ratio in Blind River uraninites varied from 12.6:1 in some Panel Mine ores to as low as 5.4:1 in some Denison Mine ores with a regional average being 10:1.

Although uranium recovery is not metallurgically complex compared to many other mineral commodities, it does require robust leaching conditions. Ifill et al (1989) demonstrates that a uranothorite grain subjected to harsh leaching conditions dissolved within 0.5 hr, and that elevated temperatures and greater acid content lead to rapid dissolution of uranothorite. Temperatures >85^{o} C are necessary for monazite dissolution.

16.2 CURRENT TESTING

During early 2011, Appia selected 3 samples of uranium-bearing quartz-pebble conglomerate (57729, 57741 and 57757) for QEMSCAN® analysis at the SGS-Lakefield metallurgical testing facility located in Lakefield, Ontario, Canada. The results of the research are summarized in a SGS report dated 22 June, 2011.

SGS describes QEMSCAN as "an acronym for Quantitative Evaluation of Materials by Scanning Electron Microscopy, a system which differs from image analysis systems in that it is configured to measure mineralogical variability based on chemistry at the micrometer-scale. QEMSCANTM utilizes both the back-scattered electron (BSE) signal intensity as well as an Energy Dispersive X-ray Signal (EDS) at each measurement point. It thus makes no simplifications or assumptions of homogeneity based on the BSE intensity, as many mineral phases show BSE overlap. EDS signals are used to assign mineral identities to each measurement point by comparing the EDS spectrum against a mineral species identification program (SIP) or database."

The results from whole rock (major element/oxide) analysis by XRD and trace element analysis by ICP is found in the report by SGS dated 22 June. Selected analytical and mineralogical data from the samples is summarized as follows in Table 16 and 17.

Table 16
Selected Chemical Analytical Data for Samples
Used for QEMSCAN Study at SGS-Lakefield

Sample Number	U	Th	Fe	La	Ce	Pr	Nd	Y	Zr	K	Al	Ca	Si
57729	0.12	0.13	2.48	0.16	0.27	0.03	0.09	0.03	0.11	3.10	4.68	0.17	36.27
57741	0.11	0.12	4.64	0.17	0.29	0.03	0.09	0.03	0.05	1.30	2.06	2.58	34.68
57757	0.02	0.03	3.62	0.03	0.06	0.01	0.02	0.00	0.02	2.21	3.29	0.62	37.26

* All values are in per cent.

The SGS QEMSCAN®™ of the samples (nominal pixel resolution of 15 µm) clearly demonstrate that the non-quartz fraction is almost entirely restricted to the matrix between quartz pebbles. Potassium feldspar is also a major component in the matrix, occurring as sub-rounded grains up to 4,000 µm in size, some containing inclusions of muscovite. Muscovite grains less than 100 µm in size typically dot the rims of quartz pebbles. Calcite, though rare, appears as essentially inclusion-free veinlets up to 1 mm in thickness. Some of the thicker calcite veins carry very fine (<200 µm) inclusions of pyrite and plagioclase.

The qualitative X-Ray diffraction results shown in Table 17 were derived by SGS-Lakefield using a Bruker D8 Advance Diffractometer, and indicate that for the three samples tested the major mineral was quartz. Minor mineral assemblages included K-feldspar-pyrite-mica, pyrite-calcite-K-feldspar and pyrite-K-feldspar. In all samples, mica was present in very low or trace amounts (Yeung and Zhou, 2011). The X-ray diffraction data did not indicate any unusual compositions to the major and minor minerals, however the data did not include useful information on uranium, REEs, or thorium which are present at the ppm level.

Table 17
Selected Mineralogy Data for Samples
Used for QEMSCAN Study at SGS-Lakefield

Sample Number	Qtz	Kspar	Musc	Ca	Py	Fe-Ti Oxides	Mon	Syn	Bas	U-Th	Z	Ap	Other REE	Col
57729-1	71.1	14.5	6.7	0.0	4.3	0.0	1.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
57729-2A	67.4	12.6	17.1	0.3	1.1	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	0.0
57729-2B	57.1	13.4	17.1	0.0	5.4	3.7	2.4	0.0	0.0	0.2	0.4	0.1	0.0	0.0
57741-A	72.4	3.5	7.0	1.7	10.9	2.1	1.7	0.1	0.1	0.2	0.1	0.2	0.0	0.0
57741-B	77.5	3.4	3.8	3.9	7.5	1.9	1.5	0.1	0.0	0.1	0.1	0.0	0.0	0.0
57757	73.5	10.7	8.5	0.9	4.2	0.6	0.2	0.0	0.0	0.1	0.0	0.2	0.0	0.0

All values are in per cent. Qtz = quartz; Kspar = K-Feldspar; Musc = muscovite; Ca = calcite; Py = pyrite; Mon = monazite; Syn = synchysite; Bas = bastnasite; Th = thorite; Z = zircon; Ap = apatite; Pych = pyrochlore

Initial probe work indicates that grains have an average size ranging between 65 and 120 µm. Bastnasite and synchysite are significantly finer at 22-28 µm and 23-31 µm, respectively. Other unnamed REE minerals are also quite fine at 22-24 µm.

Metallic mineral grains are not uniformly distributed in the matrix. Pyrite, Fe (+/- Ti) oxides, monazite, pyrochlore, REE minerals, apatite and zircon typically occur as enriched bands crossing the matrix except where disrupted by larger quartz pebbles. This has the appearance of micro-bedding or mm-scale sorting of the heavy mineral fractions (Plate 15). This aspect of heavy mineral distribution is better evidenced in some sample sections than in others, especially those scan images in which grain size is less than 3 mm. In scan images, calcite and mica have the appearance of being a late veining stage as evidenced by it occurring along fractures both in the matrix and within quartz pebbles.

A Scanning Electron Microscope (SEM) equipped with X-ray Energy Dispersive Spectrometer was used to acquire back scattered electron images and semi-quantitative analyses. Initial SEM data indicated that monazite is the main REE carrier followed by bastnasite/synchysite/parisite. REE phases include monazite $(Ce,La,Nd,Th)PO_4$ and fluoro-carbonates including bastnäsite, bastnäsite-(Ce) with a formula of $(Ce,La,Nd)CO_3F$, and calcium fluoro-carbonates $Ca(Ce,La)_2(CO_3)_3F_2$ and synchysite $Ca(Ce,La,Nd)(CO_3)_2F$. Uranium and thorium are likely present as thorite and uraninite, uranothorite, thorite and coffinite although these mineral names are based on semi-quantitative SEM-EDS analyses. Uranium and thorium minerals occur together and are difficult to resolve at the 15 µm resolution of the probe. Taking as an example sample 57729-1, SGS summarized the mineralization as:

- "Pyrite is significant in the sample, generally fine-grained, <50 µm to 0.5 mm, with aggregates up to 1 mm, but generally ~0.3 mm in size. It is well-formed and crystalline and is present as subhedral, angular grains, and locally forms aggregates. It is generally disseminated in the sample and interstitial to the main silicates. It hosts rare chalcopyrite inclusions of <50 µm.
- Monazite mineralization (1%) is characterized by fine-grained particles and is strongly associated with pyrite. Monazite is up to 0.3 mm in size and is subhedral to subrounded in habit. It has a cloudy appearance under the optical microscope that is attributed to the fine-grained thorite inclusions. It carries mainly cerium, and less lanthanum and neodymium.
- Thorite is tentatively identified and may carry significant uranium. It ranges from 5 µm to 30 µm in size, as angular and sub-rounded inclusions in monazite, but also forms distinct grains up to 0.3 mm in size. It is also associated with pyrite mineralization, and occurs interstitial to silicates and as attachments on monazite.
- Uranium minerals occur as either coffinite/uraninite or uranothorite. They occur as 5 µm to 70 µm, sub-rounded and anhedral shaped grains having a heterogeneous textural and chemical nature. They are locally complexly intergrown with silicates and pyrite. They form micrometric rims around pyrite and inclusions close to the edge of pyrite. They are also observed in close association with monazite and thorite."

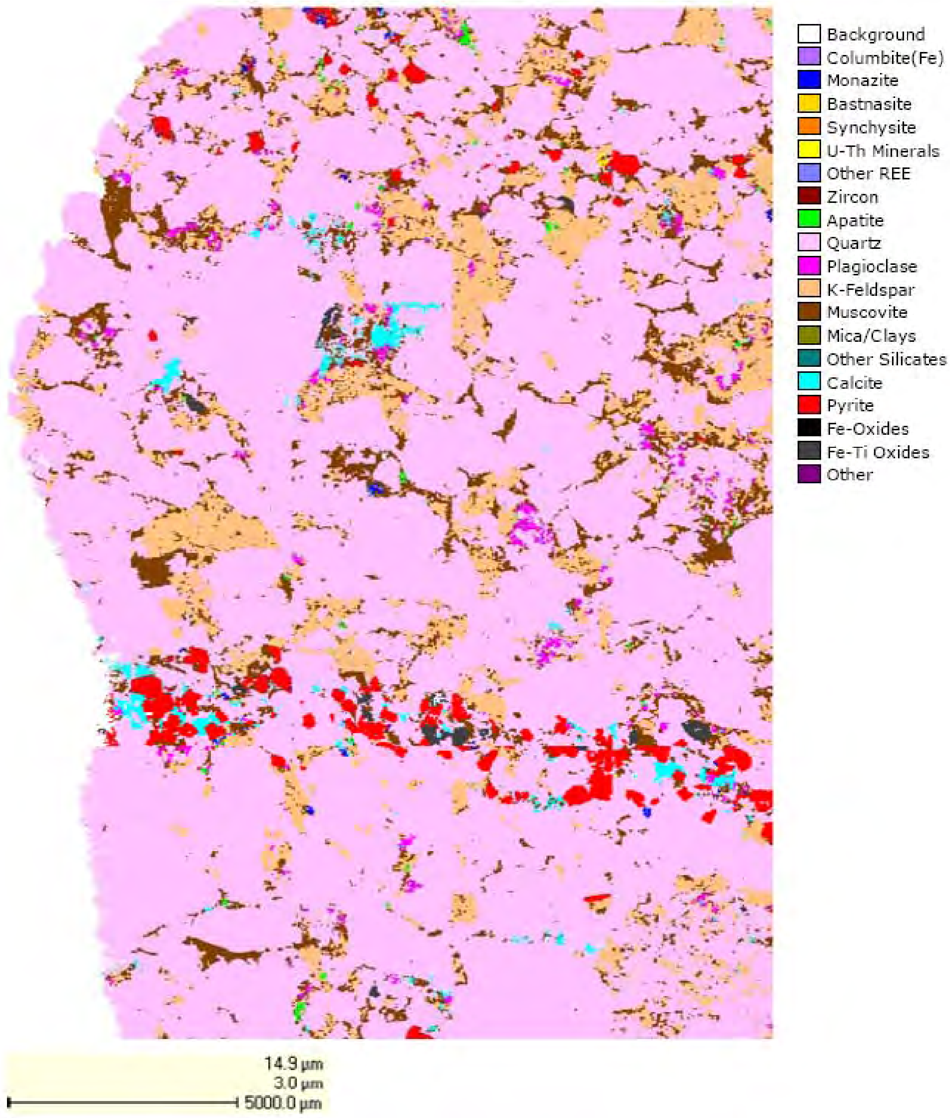


Plate 15: QEMSCAN image of sample 57757 showing pyrite, Fe-oxides, U-Th and REE minerals concentrated along bedding feature) from SGS, June 2011.

SGS concluded that the REE-U-Th mineralization is of a disseminated type, and it is strongly associated with pyrite. The metallic minerals are generally interstitial to the main silicates, and rarely do these minerals occur as inclusions in silicates, e.g., quartz. SGS concluded that the distribution related to the original bedding in the rocks, a view shared by WGM. SGS concluded that the distribution related to the original bedding in the rocks, a view shared by WGM. SGS speculated that these features would allow good liberation of the metallic minerals collectively during mineral processing.

SGS underscores the close association between urano-thorium and REE minerals with pyrite, however some SEM images show more than an association; Plate 16 shows a U-Th phase clearly replacing pyrite.

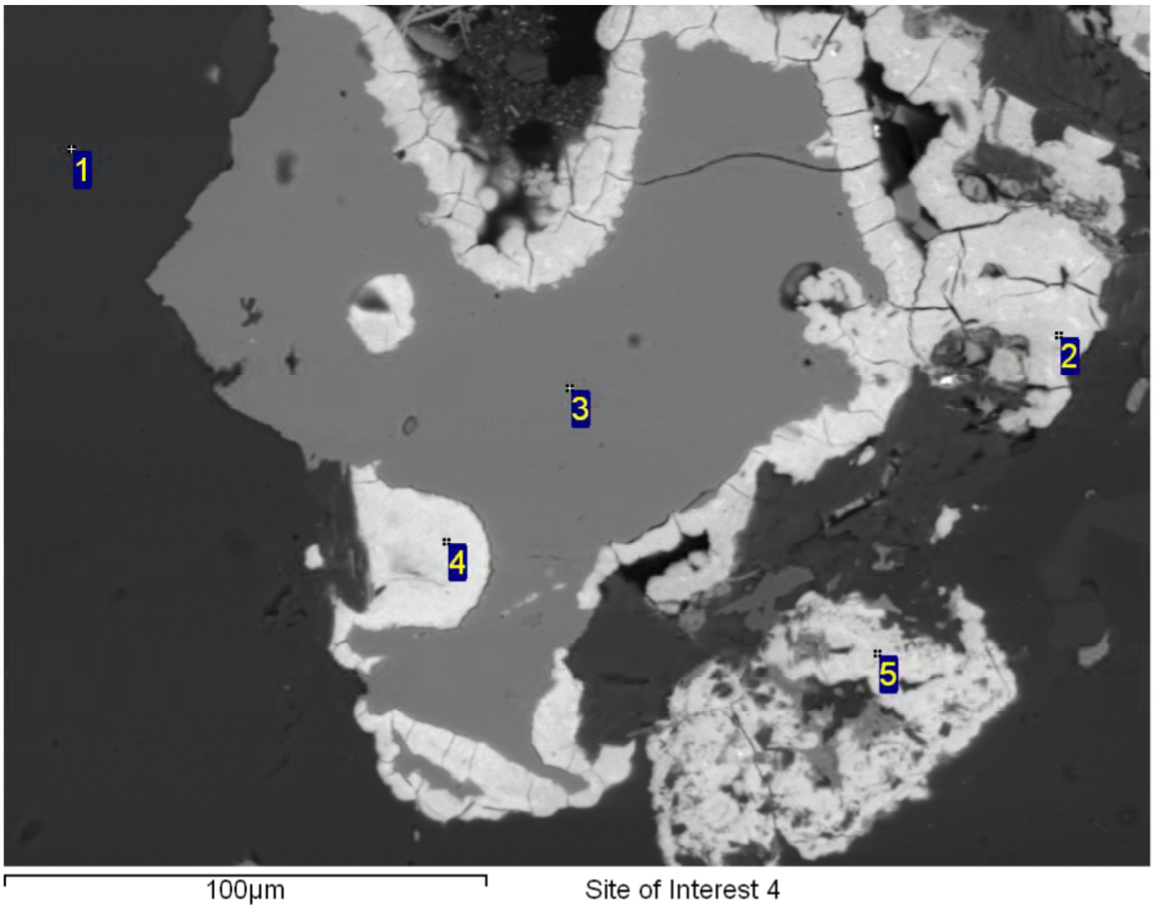


Plate 16: SEM image of U-Th +/- Y mineral (areas 2, 4 and 5) rimming and replacing pyrite (area 3) in quartz groundmass (area 1) – study site 4 in sample # 57741A – from SGS, June 2011.

The QEMSCAN data (Table 18) show that sample #57757 contains significantly less uranium, thorium and REEs than the other two samples which carry in excess of 0.1% U and 0.6% REEs. SGS concluded that cerium, lanthanum, neodymium, uranium and thorium contents were significantly elevated in samples #57729 and #57741 and enrichment was also present in yttrium, samarium and praseodymium. Monazite and fluoro-carbonates were found to account for most of the LREE. Yttrium was frequently identified in uranium and thorium minerals. SGS recommended that electron microprobe analyses be carried out to determine the distribution of the REE within the minerals identified. Monazite is the primary REE phase. Bastnasite, synchysite and parisite are also present in trace amounts and carry a proportion of the LREE. Monazite also hosts a number of micrometric thorite inclusions. Thorite is the principle Th-mineral. Uranium is predominantly present as coffinite/uraninite and uranothorite.

Table 18
REE and Related Trace Element Geochemistry
of Samples Selected For QEMSCAN Study

Element	#57729-2 A/B	#57741	#57757
La (ppm)	1550	1700	304
Ce (ppm)	2680	2870	570
Nd (ppm)	924	936	166
Pr (ppm)	318	324	52.1
Sm (ppm)	153	155	23.6
Dy (ppm)	74	65	9
Er (ppm)	31	26.3	3.5
Eu (ppm)	6.1	5.8	1.6
Gd (ppm)	126	125	20
Ho (ppm)	12.6	11.1	1.5
Lu (ppm)	3.4	2.8	< 0.6
Sc (ppm)	7	4	3
Tb (ppm)	17.1	15.9	2.1
Yb (ppm)	25.2	20.6	2.6
Tm (ppm)	4.27	3.48	< 0.8
Y (ppm)	289	279	35.2
U (ppm)	1160	1100	158
Th (ppm)	1310	1210	333
Nb (%)	0.01	< 0.01	< 0.01
Zr (%)	0.11	0.05	0.02

The commercial viability of REE mineralization was previously demonstrated by the historical recovery of yttrium as a by-product of uranium production at the Elliot Lake mines. These operations proved that separate facilities were not required to leach the REEs, and that once in solution, yttrium could be easily recovered. However the mine operators ignored the other REEs because the market was adequately served by deposits elsewhere. At present, Appia plans to produce a high-value REE-uranium concentrate through beneficiation of the ore. Appia future production plans will be determined by market conditions at that time, but will likely focus on either extracting the metals from solution as uranium oxide and as combined REE-oxides known as mischmetal, or producing a U-REE concentrate for sale. Appia's assay data indicates that the value of the REEs present will largely vest in cerium, lanthanum, neodymium and yttrium which account for 86.3% of the total REEs present.

17. MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

17.1 GENERAL

WGM prepared an updated Mineral Resource estimate for mineralized zones belonging to the Teasdale and Banana Lake Zones that have sufficient data to show continuity of geology and grades (Tables 19 and 20). The Teasdale Zone estimate was prepared from a polygonal model using a geological cut-off and a minimum bed thickness of 2.44 metres (8 ft.) which takes into consideration the continuity of grade within the various mineralized beds and historical mining practices. No grade cut-off or high capping was used for this estimate as the grades were themselves quite robust and the utilization of a cut-off grade would require complex economic modelling of individual metals that is not required at this time. The estimate was based on total REE content ("**TREE**") as the main subject of interest, however the average grade of the most abundant individual rare metals was estimated. The mineralized zone was geologically constrained by the well defined markers provided by the upper surface of the highest mineralized bed and the lower surface of the basal bed.

Table 19
Summary of Teasdale Zone Rare Earth Metal and Uranium Resource Estimate

Category	Tonnes ('000)	Tons ('000)	TREE (lbs/ton)	U_3O_8 (lbs/ton)	Average Thickness (m)	Contained TREE ('000 lbs)	Contained U_3O_8 ('000 lbs)
Indicated	3,366	3,710	2.92	0.506	9.76	10,852	1,878
Inferred	21,217	23,388	3.62	0.615	7.22	85,895	14,379

Notes:
1. Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
2. The quantity and grade of reported Inferred Resources in this estimation are uncertain in nature and there has been insufficient exploration to define these Inferred Resources as an Indicated or Measured Mineral Resource and it is uncertain if further exploration will result in upgrading them to an Indicated or Measured Mineral Resource category.
3. The Mineral Resources were estimated using the Canadian Institute of Mining, Metallurgy and Petroleum standards on Mineral Resources and Reserves, Definitions and Guidelines prepared by the CIM Standing Committee on Reserve Definitions and adopted by CIM Council December 11, 2005.
4. S.G. of 2.85 tonnes/m^3 (or 3.14 tons/m^3) was used.
5. Indicated amounts may not precisely sum due to rounding.

The average grades for the individual REEs comprising the TREE are shown in Table 20.

Table 20
Individual REE Resource Grade Composition Summary

Category	Light REE (lbs/ton)						Heavy REE (lbs/ton)									
	La	Ce	Pr	Nd	Sm	Eu	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Y**
Indicated	0.75	1.33	0.13	0.43	0.07	0.002	**0.04**	**0.01**	**0.03**	**0.004**	**0.010**	**0.002**	**0.01**	**0.002**	**0.01**	**0.11**
Inferred	0.93	1.64	0.16	0.53	0.09	0.004	**0.06**	**0.01**	**0.03**	**0.016**	**0.012**	**0.002**	**0.01**	**0.002**	**0.01**	**0.13**

Qualifying notes for Mineral resources are contained in Table 19 on page 143.

The Banana Lake Mineral Resource estimate (Table 21) was prepared from a block model using a 0.6 lb U_3O_8/ton cut-off grade, a minimum vertical thickness of 5 m, and based on the assumption that material from this deposit would be refined in a central milling facility that would accommodate neighbouring mining operations in the Elliot Lake camp, thus significantly reducing capital and operating costs. The increased minimum thickness was imposed by WGM to provide a basis for the use of larger underground equipment as a cost-reduction strategy, however this restriction had little impact on the contained resources.

Table 21
Summary of Banana Lake Zone Mineral Resource Estimate
(using 0.6 lb U_3O_8 / ton Cut-Off Grade)

Category	Tons ('000)	S.G. (tons/m^3)	lbs U_3O_8/ton	Total lbs U_3O_8 ('000)
Inferred Resources	30,315	3.14	0.912	27,638

Note: The reader is advised to review qualifying notes that are found in Table 19 on page 143.

The classification of Mineral Resources used in this report conforms with the definitions provided in the final version of NI 43-101, which came into effect on February 1, 2001, as revised on April 8, 2011. We further confirm that, in arriving at our classification, we have followed the guidelines adopted by the Council of the Canadian Institute of Mining Metallurgy and Petroleum ("**CIM**") Standards. The relevant definitions for the CIM Standards/NI 43-101 are as follows:

> A *Mineral Resource* is a concentration or occurrence of diamonds, natural, solid, inorganic or 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.

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.

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.

A *Measured Mineral Resource* is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, 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.

A *Mineral Reserve* is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

A *Probable Mineral Reserve* is the economically mineable part of an Indicated, and in some circumstances a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

A *Proven Mineral Reserve* is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

Mineral Resource classification is based on certainty and continuity of geology and grades. In most deposits, there are areas where the uncertainty is greater than in others. The majority of the time, this is directly related to the drilling density. Areas more densely drilled are usually better known and understood than areas with sparser drilling.

17.2 TEASDALE LAKE ZONE

17.2.1 2008 WGM ESTIMATE

A historical resource estimate was prepared by Mr. Doug Sprague, P.Eng., former Chief Geologist for Rio Algom Ltd. at Elliot Lake (Sprague). This estimate, totalling some 17.5 million tons of uranium mineralization having an average grade of 1.21 lbs U_3O_8 per shot ton, is herein described in this report under Section 5.3 Historical Reserves and Resources.

During 2008, WGM carried out a detailed audit of the Sprague resource estimate. WGM's review was based on a combined database encompassing the original 16 historical drill holes plus six holes completed by Appia during its winter 2007-08 drilling program. WGM concluded that a search radius of 89 metres (338 feet) and a cut-off grade of 0.65 lbs U_3O_8/ton would produce a resource estimate that approximated that of Mr. Sprague. The result of WGM's audit was that the zone contained approximately 18.5 M tons grading 1.17 lbs U_3O_8/ton for a total of approximately 21.72 M lbs of contained U_3O_8. WGM's search radius was comfortably within the 400 ft extrapolation distance used historically for reserve estimation at the operating mines at Elliot Lake. WGM was essentially satisfied that the Sprague estimate was reasonable based on the information available.

During 2008, WGM also completed a new uranium resource estimate for the Teasdale Lake Zone that was reported in a technical report by Workman and Vasek (2008). This estimate was compliant with the provisions of NI 43-101, and the relevant portions of this report are attached hereto in the Appendices. The resources were classified at a range of cut-off grades. The data show that using a cut-off of 0.60 lbs U_3O_8/ton cut-off results in an Indicated Mineral Resource of 17.4 million tons (15.8 Mt) with an average grade of 1.10 lbs U_3O_8/ton (0.55 kg U_3O_8/t) and an Inferred Mineral Resource of 48 million tons (43.5 Mt) at the same grade. At this cut-off grade, the uranium oxide contained in Indicated and Inferred resources is 19.0 Mlbs and 52.7 Mlbs, respectively.

17.2.2 CURRENT MINERAL RESOURCE ESTIMATE

The current WGM Mineral Resource estimate (Table 19) takes in both uranium and rare earth element mineralization and is based on the six holes completed by Appia. This represents a subset of the total 22 holes drilled on the deposit and used in the aforementioned WGM audit. Because only these six Appia holes were assayed for rare earths, the current Mineral Resource estimate has been restricted to the area of influence of this data and the historical drill holes have been necessarily excluded. Therefore the estimated U-REE resource is a smaller volume (tonnage) of mineralized rock that is contained within the previous, larger U-only resource estimate reported in the foregoing section.

The estimate was prepared from a polygonal model using a C$:US$ exchange rate of 1:0.9 and on the following metal prices (per kilogram, unless otherwise noted): La_2O_3 $12.53; Ce_2O_3 $10.80; Pr_2O_3 $31.66; Nd_2O_3 $32.49; Sm_2O_3 $7.71; Gd_2O_3 $7.91; Eu_2O_3 $506.09; Dy_2O_3 $152.25; Y_2O_3 $22.05, and; uranium US$55/lb. No per cent TREE cut-off was used for the reporting of resources, however implicitly there is an internal cut-off grade of about 0.05% TREE (i.e. the lowest grade interval included in the mineralized envelope at the hanging wall and footwall contacts). The resource envelop was geologically constrained by the geological contacts of the zone as follows:

- the upper surface of the stratigraphically highest U-bearing conglomerate (reef); and,
- the under surface of the stratigraphically lowest U-bearing reef.

WGM imposed a 2.44-metre (8 ft) minimum thickness requirement on the Teasdale Zone which reflects historical mining practices in the Elliot Lake district. All of the Appia drill hole intersections exceeded this thickness. The Indicated and Inferred Mineral Resources are reported in Tables 19 and 20, and are summarized in detail on a hole-by-hole basis as follows:

Drill Hole	Tonnes ('000)	Tons ('000)	TREE (%)	U_3O_8 (lb/ton)	Average Thickness (m)	Contained TREE ('000 lbs)	Contained U_3O_8 ('000 lbs)
Indicated Mineral Resources							
Q-07-01	1,570	1,731	0.150	0.519	9.07	5,193	898
Q-08-05	1,795	1,979	0.143	0.495	10.37	5,660	979
Total *	3,366	3,710	0.146	0.506	9.76	10,852	1,878
Inferred Mineral Resources							
Q-07-01	3,444	3,796	0.150	0.519	9.07	11,389	1,970
Q-07-02	2,599	2,865	0.285	1.051	3.74	16,329	3,011
Q-07-03	5,156	5,683	0.200	0.718	7.42	22,733	4,081
Q-08-04	1,680	1,852	0.277	0.704	2.55	10,261	1,304
Q-08-05	3,565	3,929	0.143	0.495	10.37	11,238	1,945
Q-08-06	4,774	5,262	0.123	0.393	6.87	12,945	2,068
Total *	21,217	23,388	0.181	0.615	7.22	85,895	14,379

** Totals may not sum due to rounding.*

Appia's assay data indicate that the value of the REEs present will largely vest in cerium, lanthanum, neodymium and yttrium which together account for 88.4% of the REEs present in the Indicated Resources and 90.1% of the REEs present in the Inferred Resources.

WGM's previous audit of Sprague's estimate showed that a representative area of influence (search ellipsoid) with a radius of 89 m would be appropriate for the deposit as this provided results very close to the historical estimate. However, based on WGM's experience and mining practice in the Blind River area, we believe that a search radius of 89 m is conservative for a stratiform uranium deposit such as those in the Elliot Lake area. Mining practice demonstrated that a spacing of several hundred metres can be used to predict grade.

In light of the geological nature of the deposit, especially its great lateral continuity, a polygonal radius of 140 was used for defining the area of influence for Indicated Resources. For comparative purposes, this radius is well within the 200 m hole spacing recently recommended by the consultants working on the Pele Mountain Resources Elliot Lake project for up-grading Inferred Resources to Indicated Resources pursuant to a NI 43-101 compliant preliminary feasibility study (Cochrane, Hwozdyk and Hayden, 2007). The Inferred Resources were calculated with a similarly defined polygonal radius of 280 m.

17.2.3 GENERAL MINERAL RESOURCE ESTIMATION PROCEDURES

The polygonal model Mineral Resource estimate procedure included:

- importing/compiling and validation of data from Microsoft Excel to Gemcom GEMS v6.2.4 to create a Project database;
- statistical analysis;
- validation of geological model for use as resource envelope;
- compositing assay intervals within the mineralized boundaries - limited to one composite per hole;
- extruding polygons around each drill collar with a radius of 140 and 280 metres, and assigning thickness' equivalent to individual composite lengths;
- reporting volumes and grade in each of the extruded polygons; and,
- categorizing the Mineral Resources according to NI 43-101 and CIM definitions.

17.2.4 DATABASE

17.2.4.1 General

Data used to generate the Mineral Resource estimates originated from Microsoft Excel files supplied to WGM by Appia. A GEMS project was established to hold all data and to be used for the manipulations necessary for the Mineral Resource estimate.

The Teasdale drill hole database consisted of the 6 new Appia drill hole collar locations in the UTM co-ordinate system and geological descriptions (holes Q-07-01 to Q-07-3, and Q-08-04 to Q-08-06). The database contained drill hole collar surveys, assays and lithological information as well as geological codes and 360 assay intervals reporting values for TREE (%) and lbs U_3O_8/ton together with other elements including: Th (ppm), ThO2 (%), LREE (%), HREE (%) and asssys for the individual REEs (%). A total of 42 samples lacked REE assays. Assay intervals averaged 0.31 m in length, with the smallest interval measuring 0.03 m and the largest measuring 2.21 m. Geological cross-sections of each of the drill holes were supplied in PDF format as well as original digital assay certificates from Actlabs.

Like with the Banana Lake Sampling, the distribution of assay intervals within the various rock type units heavily favoured conglomerate (307) samples versus quartzite (51 samples) and argillite (2 sample). The high concentration of samples in the conglomerate unit (85% of total) coincides with uranium mineralization in the quartz pebble conglomerate of the Matinenda Formation.

17.2.4.2 Data Validation

Upon receipt of the data, WGM performed the following validation steps:

- ✓ checking for location and elevation discrepancies by comparing collar coordinates with the copies of the original drill logs received from the site;
- ✓ checking minimum and maximum values for each quality value field and confirming/modifying those outside of expected ranges;
- ✓ checking for inconsistency in lithological unit terminology and/or gaps in the lithological code;
- ✓ spot checking original assay certificates with information entered in the database; and
- ✓ checking for gaps, overlaps and out of sequence intervals for both assays and lithology tables.

The assay table contained no errors when compared to the original certificates, and were deemed appropriate for use in the subsequent Mineral Resource estimate. Some gaps or missing intervals identified were due to unsampled / unassayed intervals outside of the mineralized zones. WGM found the database to be in good order and accurate and no errors were identified that would have a significant impact on the Mineral Resource estimate.

17.2.4.1 Database Management

The drill hole data were imported into a GEMS multi-tabled workspace specifically designed to manage collar and interval data. The project database stored cross section and level plan definitions, such that all data pertaining to the project are contained within the same project database. A copy of the project database is stored in WGM's servers in Toronto.

17.2.5 GEOLOGICAL MODELLING PROCEDURES

A single inclined section was defined for the Teasdale Zone which closely paralleled the dip of the mineralized zone. The inclined plane strikes approximately 103 degrees to the east, and dips gently about -16 degrees to the south. Figure 13 shows the drill hole intercepts in 3D and the relative position of the inclined plane in 3D space.

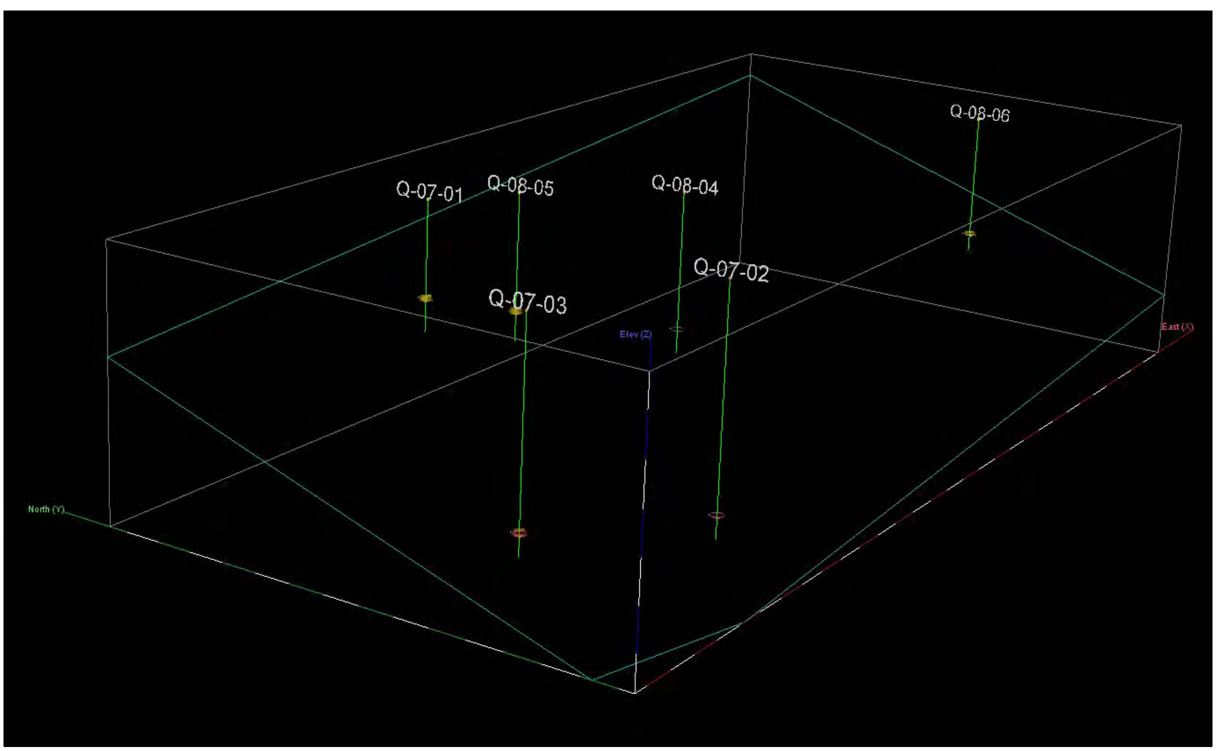


Figure 13. 3D view looking NE showing drill holes through the Teasdale mineralized zone.

17.2.6 GEOLOGICAL INTERPRETATION

The mineralized zones used for the resource are defined by the volume between the upper surface of the highest reef and the basal contact of the lowest reef, according to Appia's designations. These are as follows:

- Q-07-01 239.63 m to 248.70 m
- Q-07-02 548.06 m to 551.80 m
- Q-07-03 486.38 m to 493.80 m
- Q-08-04 349.05 m to 351.60 m
- Q-08-05 292.69 m to 303.06 m
- Q-08-06 326.44 m to 333.31 m

17.2.7 TOPOGRAPHIC SURFACE CREATION

A topographic surface or triangulated irregular network ("TIN") was generated using collar elevations of the holes drilled from surface for the entire Teasdale Zone. This was not seen as being crucial for this stage of the Mineral Resource estimate, as the zones would likely be mined by underground methods.

17.2.8 STATISTICAL ANALYSIS, COMPOSITING, CAPPING AND SPECIFIC GRAVITY

17.2.8.1 Statistical Analysis and Compositing

The original assay intervals varied in length, requiring normalization to a consistent length in order to carry out the Mineral Resource grade interpolation. A set of equal length 1-metre composites was generated from the raw sample intervals. A total of 43 composites were generated of which all but two (in quartzite) fall within conglomerates. The statistics of the composites inside the defined mineralized zones for TREE and U_3O_8, which were used for the Mineral Resource estimate, are summarized in Table 22. For its analysis, WGM examined the zones as a whole. The results of this study are illustrated in Figures 14 and 15.

Table 22
Basic Statistics of the One Metre Composites

Zone	Number	Mean TREE (%)	Mean U3O8 (lbs/ton)	C.O.V.* (TREE)	C.O.V.* (U_3O_8)
Teasdale	43	0.174	0.627	0.54	0.60

*Co-efficient of Variation

17.2.8.2 Cut-Off Grade and Grade Capping

The Preliminary Assessment prepared for Pele's Eco Ridge deposit suggests that the Teasdale uranium-REE grade is sufficient to support an economically viable mining operation, and that the challenge for Appia is to demonstrate that sufficient tonnage exists to justify mine development. WGM did not use a cut-off grade in its estimate as the value-matrix of the U and REE contents would be quite complex to model. WGM's review of the REE data indicated that the grades were sufficiently robust and continuous to support mining the entire reef section as a single minable zone as was the practice in the past. The variability between individual REEs also favoured a focus on TREE content rather than individual metals. Hence the use of geological constraints rather than a specific cut-off grade. One major consideration in determining a cut-off grade would be whether or not the ore from this deposit could be processed in a central milling facility that would accommodate neighbouring mining operations in the Elliot Lake camp. This would significantly reduce capital and operating costs. It is clear that a Preliminary Assessment of the Teasdale Zone is needed to explore mining and processing options.

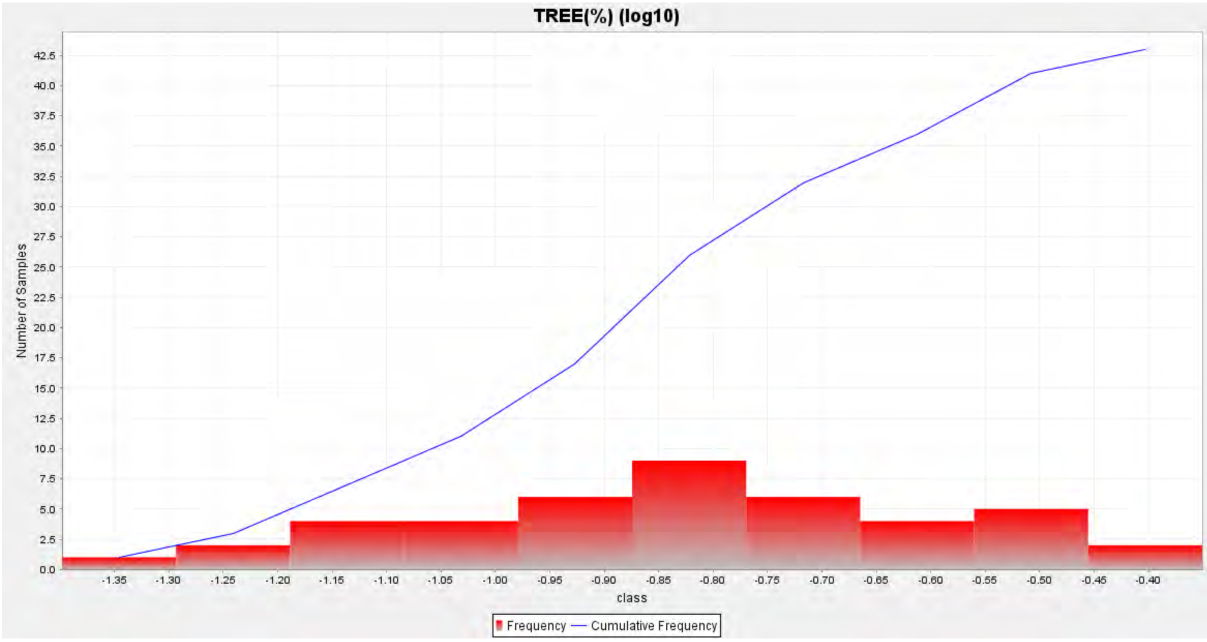


Figure 14. LOG normal histogram, TREE 1m composites within the entire mineralized zone

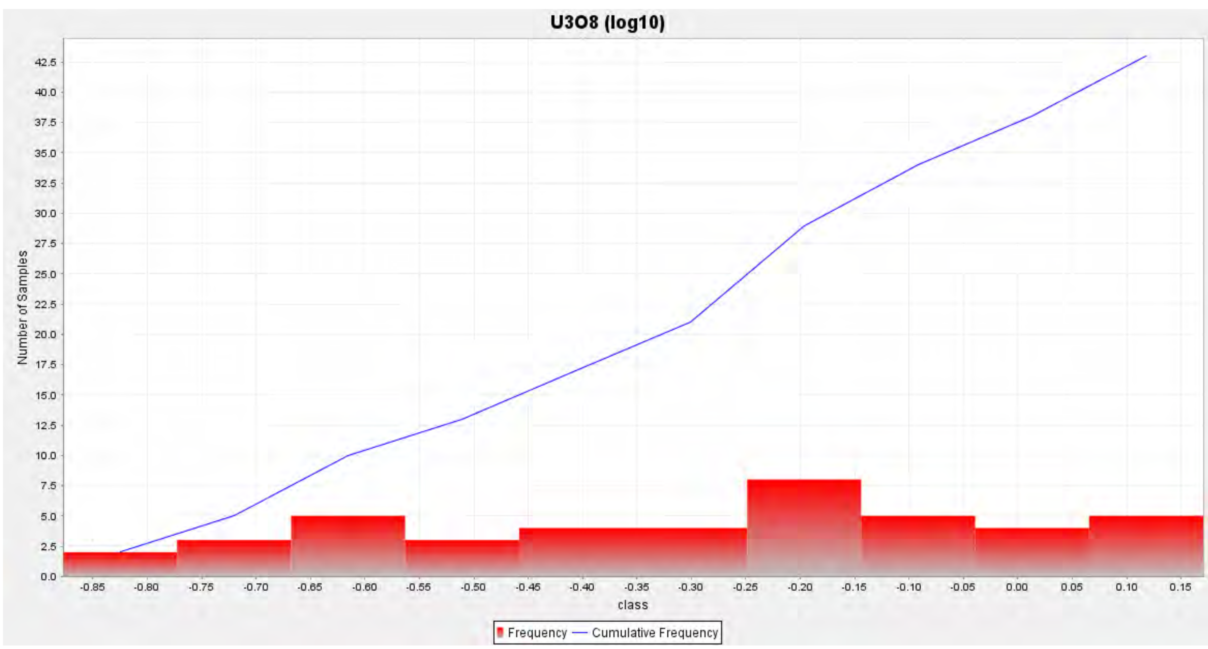


Figure 15. LOG normal histogram, U_3O_8 composites within the entire mineralized zone

While the resources have been constrained for the resource estimate solely by geological marker horizons (boundaries), the hanging wall and footwall contacts of the mineralized zone include assays greater than or equal to 0.05% TREE. Much of this low grade material will likely be considered internal dilution for bulk underground mining (e.g. room and pillar). These parameters were chosen based on a preliminary review of the parameters that would likely determine the economic viability of an underground mining operation and comparison to similar projects in the area that are currently being mined or are at an advanced stage of study / development.

Due to the low composite sample population, there is insufficient data to support the use of high-grade capping at the Teasdale Zone. Grade capping, also sometimes referred to as top cutting, assay grades is commonly used in the Mineral Resource estimation process to limit the effect (risk) associated with extremely high assay values since high-grade outliers can contribute excessively to the total metal content of the deposit. Philosophies or approaches to establishing and using a grade cap is variable across the industry and includes, for example, not using grade caps at all, arbitrarily setting all assay grades greater than a certain value to a high grade "limit", choosing the grade cap value to correspond to the 95 percentile in a cumulative distribution, evaluation of Mean Grades + multiple levels of Standard Deviations and the evaluation of the shape and values of histograms and/or probability plots to identify an outlier population. Another rule of thumb is to set the capping level to lower the top 10% of the metal content in the deposit. WGM recommends that further geostatistical investigation be conducted as new drilling data becomes available, however, there is no historical basis for high-grade capping given the laterally continuous nature of the mineralization. Also, the low coefficient of variation ("**C.O.V.**") for both TREE and U_3O_8 1-metre composites would suggest that top-capping is unnecessary. Typically, capping is only warranted if the C.O.V. is above 1.0.

The statistical distribution of TREE shows relatively good lognormal distributions, whereas U_3O_8 appears to be exhibit a more bi-modal distribution.

17.2.8.3 Density / Specific Gravity

A specific gravity factor of 2.85 tonnes per cubic metre (3.14 tons/m^3) was used for volume conversion based on 14 samples tested by Appia at the Actlabs laboratory. WGM has accepted this SG as an approximation as it compares favourably with those from similar deposits in the Elliot Lake area (and was the basis of WGM's 2008 resource estimate).

WGM recommends that the SG results, like all assays, should also be stored in an assay database table for ease of use and comparison purposes.

17.2.9 POLYGONAL MODEL PARAMETERS, GRADE INTERPOLATION AND CLASSIFICATION OF MINERAL RESOURCES

17.2.9.1 General

The Mineral Resources have been estimated using the Polygonal method whereby a circular area of influence is assigned to each drill hole composite, from which a volume can be calculated using the true thickness of the composite interval.

17.2.9.2 Polygonal Model Set-Up and Parameters

The polygonal model was created using the GEMS v.6.2.4 software package to create two sets of polygons around each drill hole composite. The first set of polygons were generated based on a 140 m radius of influence and the second set on 280 m. The area of the polygon was determined by the area of influence deemed appropriate for the individual drill hole based on drilling density. The thickness of the polygons, and thus volume, was determined by the hanging wall and footwall contact of the composite.

Polygon data including area, volume, density, tonnage, grade and hole-id, was stored in a multi-tabled workspace in GEMS.

17.2.9.3 Grade Interpolation / Bed Composites

Variograms were generated in an attempt to characterize the spatial continuity of the mineralization in the defined zones, however, due to the lack of data, meaningful variograms could not be computed. The geology and geometry is fairly well understood, so the area of influence and orientation of the polygons were based on this geological knowledge, as opposed to variograms.

Thus, grades were assigned to the polygons based on a single length-weighted average bed composite as described in Section 17.4.2.

17.2.9.4 Mineral Resource Classification

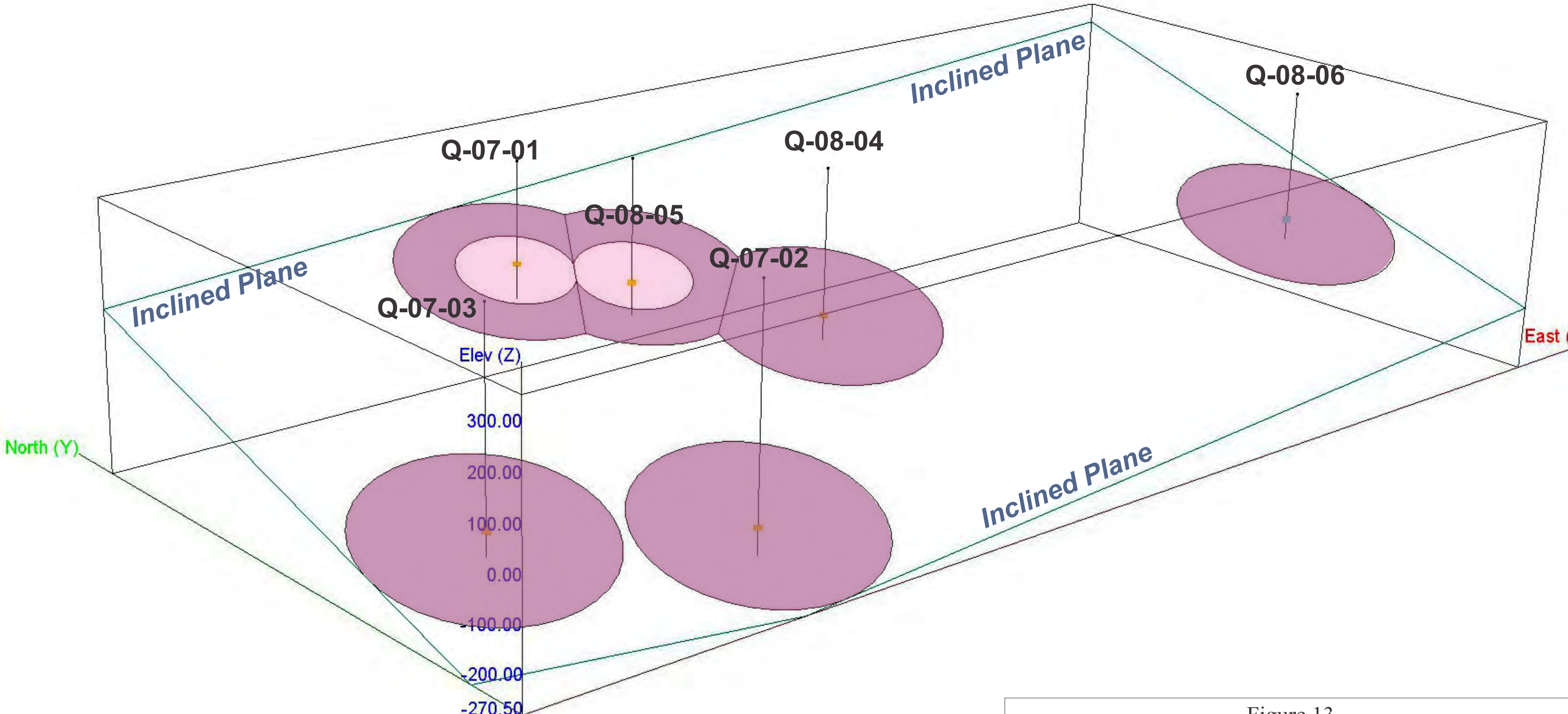
To categorize the Mineral Resources, WGM classified each of the smaller polygons (140 m radius) as Indicated, and the larger sets of polygons (280 m radius) as Inferred. Also, smaller polygons which did not intersect adjoining smaller ones, were automatically downgraded to the Inferred category due to insufficient drilling density, thus eliminating the less than ideal "bull's eye" effect.

All drill holes were included in the resource estimates; none failed to exceed the minimum vertical thickness of 2.44 m for the mineralized zone which is the historical minimum used when the Elliot Lake mines were in production. WGM recommends that subsequent studies on the Property include preliminary underground mining studies to determine the appropriateness of the 2.44 metre minimum vertical height restriction in light of recent developments in the design of mining equipment. Such studies should also consider the potential for losses in mining recovery due to mineralized rock left in situ as supporting pillars.

The Mineral Resource estimates contained herein do not account for mineability, selectivity, mining loss and dilution.

Figure 16 shows the interpolated polygons and categorization on the inclined plane. The visual comparison of polygonal model grades with the 1-metre composite grades shows a reasonable correlation between the values. The orientation of the polygons follows more or less the plane of mineralization. At this early stage of the resource model, it is doubtful that block modelling of the resource would significantly improve the interpolation.

APE REV / APE_15_3D_Model.cdr
Last revision date: Wednesday 7 November 2012



Legend:

Mineral Resource Categorization

- *Indicated*
- *Inferred*

Figure 13.

APPIA ENERGY CORP.

Elliot Lake Property

Ontario, Canada

3D View Looking NE Showing Drill Holes Through the Teasdale Mineralized Zone

Graphics by Watts, Griffis and McOuat Limited

Watts, Griffis and McOuat

17.3 BANANA LAKE ZONE

17.3.1 INTRODUCTION

WGM prepared a NI 43-101 compliant Mineral Resource estimate for the Banana Lake deposit. The Mineral Resource estimate is based on a total of seven (7) diamond drill holes, the results of which are summarized in Table 23 and described in greater detail in this section. The estimate was prepared from a block model using a 0.6 lb U_3O_8/ton cut-off grade based on a uranium price of US$65/lb and a C$:US$ exchange rate of 1:0.9, and a minimum vertical thickness of 5 m to accommodate larger mining equipment at this depth. The Preliminary Assessment prepared for Pele's Eco Ridge deposit indicates the possibility that Banana Lake mineralization could support a viable mining operation, and that the challenge for Appia is to demonstrate that sufficient tonnage exists to justify mine development. Although the Banana Lake Zone is much thicker than the Eco Ridge deposit, it is also significantly deeper. It is clear that a Preliminary Assessment is needed to estimate the resource (tonnes and grade) threshold that the deposit should clear to be economically viable, as well as exploring mining and processing options. One consideration in determining such inputs as a cut-off grade would be whether or not the ore from this deposit could be processed in a central milling facility that would accommodate neighbouring mining operations in the Elliot Lake camp. This would significantly reduce capital and operating costs and allow for a lower cut-off.

Table 23
Banana Lake Zone Mineral Resource Estimate
(using 0.6 lb U_3O_8/t cut-off)

Category	Tons ('000)	S.G. (tons/m^3)	lb U_3O_8/t	Total lbs U_3O_8 ('000)
Inferred Resources	30,315	3.14	0.912	27,638

Notes:
1. Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.
2. The quantity and grade of reported Inferred Resources in this estimation are uncertain in nature and there has been insufficient exploration to define these Inferred Resources as an Indicated or Measured Mineral Resource and it is uncertain if further exploration will result in upgrading them to an Indicated or Measured Mineral Resource category. Mineral Resources and Mineral Reserves are defined in Section 17.1 of this report.
3. The Mineral Resources were estimated using the Canadian Institute of Mining, Metallurgy and Petroleum standards on Mineral Resources and Reserves, Definitions and Guidelines prepared by the CIM Standing Committee on Reserve Definitions and adopted by CIM Council December 11, 2005.
4. S.G. of 2.85 tonnes/m3 (or 3.14 tons/m3) was used.
5. All tonnage and total lbs U_3O_8 amounts rounded to nearest thousand or thousandth. Totals may not add up due to rounding

17.3.2 GENERAL MINERAL RESOURCE ESTIMATION PROCEDURES

The Mineral Resource estimate procedures consisted of:

- Database compilation and verification;
- Statistical analysis and assay compositing; and
- Generation of a geological and block model using a geostatistical approach applying the Inverse Distance Squared ("ID^2") method.

17.3.3 DATABASE

17.3.3.1 General

The data used to generate the Mineral Resource estimates originated from Microsoft Excel files containing key data such as drill hole collar, survey, assay, and lithological information. The drill hole database consisted of 7 collar locations in the UTM co-ordinate system (of which 5 are wedges off of newer and/or historical holes) covering approximately 41 hectares, geological descriptions, and 974 assay intervals of various lengths measuring lbs U_3O_8/ton, Au (ppm) and Th (ppm). Lithological cross-sections of each of the drill holes were supplied in PDF format, as well as original digital assay certificates as supplied by Actlabs of Ancaster, Ontario. Figure 8, located in a foregoing section of this report, illustrates the location of the drill holes.

The distribution of assay intervals within the various rock type units is summarized in Table 24 below. The high concentration of samples in the quartzite and conglomerate units coincides with uranium mineralization in the Ryan Member of the Matinenda Formation.

Table 24
Distribution of Raw U_3O_8 Assays in Various Rock Types

Rock Type	# Samples	Mean Grade (lb U_3O_8/ton)	Mean Width (m)
Argillite	1	0.011	1.0
Metavolcanics	17	0.205	0.5
Quartzite	213	0.684	0.4
Conglomerate	743	0.417	0.4

17.3.3.3 Data Validation

Following receipt of the Appia data, WGM performed the following validation steps specifically checking for:

- location and elevation discrepancies by comparing collar coordinates with the available cross-sections;
- minimum and maximum values for each quality value field and confirming/modifying those outside of expected ranges;
- comparison of assay values in database to those indicated on original digital assay certificates;
- inconsistency in lithological unit terminology and/or gaps in the lithological code; and,
- gaps, overlaps and out of sequence intervals for both assays and lithology tables.

The database was determined to be in good order, and no errors were identified that would have a significant impact on the Mineral Resource estimate.

17.3.3.3 Database Management

The drill hole data were stored in a Gemcom GEMS© software multi-tabled workspace specifically designed to manage collar and interval data. Other data, such as surface contours, were stored in 3-D wireframe (or TIN) workspaces. The project database also stored the block model data such that all data pertaining to the project are stored within the same project database. A copy of the GEMS project data is stored on WGM's file servers in Toronto.

17.3.4 GEOLOGICAL MODELLING PROCEDURES

In general, the modelling procedures were as follows:

- database manipulation and assay compositing;
- 3-D surface and solid (TIN) wireframe creation;
- statistical analyses;
- block grade estimation; and,
- classification and reporting of Mineral Resources.

17.3.5 STATISTICAL ANALYSIS AND ASSAY COMPOSITING

17.3.5.1 General

In order to carry out geostatistical analysis of the assay database for the Mineral Resource block modelling, a set of equal length sample composites of 1-metre length was generated throughout the entire length of each drill hole intersection. Table 25 shows basic statistics of the original (uncomposited) samples in the area of the Banana Lake deposit. Assaying of drill core started at the base of the Ramsey Lake conglomerate, anywhere from 1,387 m to 1,501 m below surface. Sample lengths were irregular and determined by geological factors. Sampling continued contiguously through and just beyond the mineralized zone to the Archean basement.

Table 25
Basic Statistics of Raw U_3O_8 Assays

# Samples	Minimum (lbs U_3O_8/ton)	Maximum (lbs U_3O_8/ton)	Mean (lbs U_3O_8/ton)
974	0.001	11.84	0.471

17.3.5.2 Compositing By Cut-Off Grade

The vertical extents of the mineralized zone were identified in each of the drill holes by compositing each drill hole based on single cut-off grade (or "optimal value" as it is defined in GEMS). The optimal value compositing method considers several parameters including: the minimum composite length (in this case, 2.44 m); the minimum composite separation (i.e. the minimum distance between adjacent composites along the same drill hole, if any - in this case, this was set to 5 m); and the cut-off grade. For each cut-off grade (from 0.4 to 0.7 in 0.1 lb U_3O_8/ton increments without REE credits), a series of larger composites was generated within each drill hole, and stored in a separate table in the database.

17.3.5.3 3D Surface and Grade Shell Generation

The large composite intervals from the previous exercise were used to generate hanging wall and footwall contacts for the mineralized zone at the various cut-off grades. Using a Laplace gridding algorithm, a 3D surface was generated for each contact. Each hanging wall and footwall were then "stitched" to form a 3D solid of the mineralized zone for each cut-off grade, and from which volumes could be derived for the block model interpolation. The resulting wireframes were visually compared to the locations of the predominant rock-type units and were deemed consistent with the geological and mineral structure of the deposit.

17.3.5.4 Back-Coding of Composites

The 3-D solids that represented the interpreted mineralized zones were used to back-code a tag field in the drill hole workspace. Each composite interval in the 1 m composite table was assigned a unique "tag" value based on the solid that the interval midpoint fell within. Table 26 shows basic statistics of the 1 m composites that fall within each of the cut-off grade shells. In all cases, there is evidence of some internal dilution within the vertical thickness of the mineralized zone. Figure 17 illustrates the assay distribution of the 1-metre composites.

Table 26
Basic Statistics of 1-Metre Composites

Cut-off grade (lbs U_3O_8/ton)	# Composites	Minimum (lbs U_3O_8/ton)	Maximum (lbs U_3O_8/ton)	Mean (lbs U_3O_8/ton)
0.4	117	0.010	2.296	0.597
0.5	80	0.040	2.296	0.724
0.6	**63**	**0.040**	**2.296**	**0.778**
0.7	55	0.121	2.296	0.813

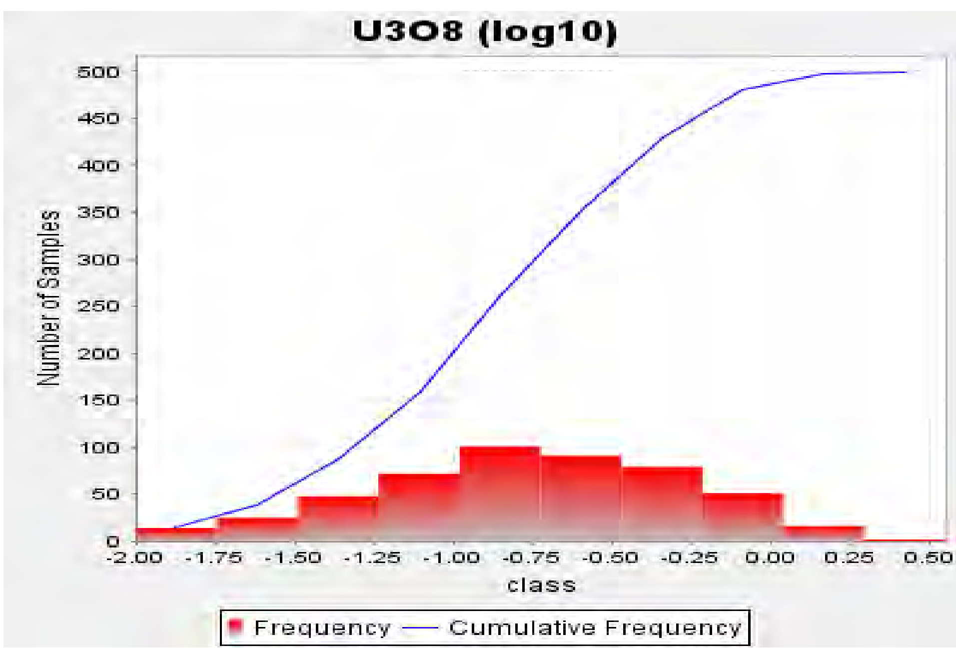


Figure 17: Assay Distribution Graph for the Banana Lake Zone.

17.3.6 MINERAL RESOURCE BLOCK MODELLING

17.3.6.1 General Approach

The Mineral Resources were estimated using the Inverse Distance Squared (ID^2) estimation technique. The "inverse distance" technique belongs to a distance-weighted interpolation class of methods, similar to Kriging, where the grade of a block is interpolated from several composites within a defined distance range of that block. This estimation procedure uses the inverse of the distance between a composite and the block as the weighting factor.

17.3.6.2 Back Coding of Rock Type Model

For each cut-off grade, a separate rock type and grade block model was generated. Individual cut-off grade shell wireframes were used to back code a separate rock type model, and subsequent grade interpolation runs were calculated based on these rock codes.
Block Model Grid Parameters

The Mineral Resources have been estimated in a single grid of regular sized blocks. The block model grid covers the extents of the mineralized zone, which is between 1300 m and 1500 m below surface. The parameters of the block model are shown in Table 27.

Table 27.
Block Model Grid Parameters

Model Origin	Grid	Model Dimension		Block Dimension	
X	368,700 E	Rows	40	Row width	40 m
Y	5,144,900 N	Columns	60	Column width	40 m
Z	-850 Z	Levels	80	Level height	5 m

17.3.6.3 Grade Interpolation

WGM used examinations of geology and overall drill hole spacing to determine appropriate search ellipse ranges for the selection of Mineral Resource categories. The overall strike and dip direction in the Banana Lake deposit is predominantly flat, thus no rotation of the search ellipse was deemed necessary. Also, because of the wide drill hole spacing, a large search ellipse range was used to establish grade continuity. As such, the results of the block modelling exercise approximate that of a polygonal estimate. A separate grade block model was generated for each cut-off grade. The search parameters and criteria for grade interpolation and categorization are show in Table 28.

Table 28.
Search Ellipse Parameters

Parameter	Value
Search Ellipsoid Dimension	1000 m X, 1000 m Y, 100 m Z
Search Ellipsoid Rotation	None
Min # samples used to estimate a block grade	5
Max # samples used to estimate a block grade	6
Max # samples from a single hole	5

17.3.6.4 Cut-Off Grade and Specific Gravity

Of major consideration in determining the cut-off grade, is the assumption that material from this deposit would be processed in a central milling facility that would accommodate neighbouring mining operations in the Elliot Lake camp. This would significantly reduce capital and operating costs. As a stand-alone mining and milling operation, a significantly higher uranium price would be required than exists as of the date of this report. Alternatively, a much higher average grade of ore would need to be mined necessitating the use of a higher cut-off grade.

Due to the low composite sample population, there is insufficient data to support the use of high-grade capping at Banana Lake. WGM recommends that further geostatistical investigation be conducted as new drilling data becomes available, however, there is no historical basis for high-grade capping given the laterally continuous nature of the mineralization.

Based on the above assumptions, and on a uranium term price of US$65/lb with a C$:US$ exchange rate of 1:0.9, the overall cut-off grade of 0.6 lb U_3O_8/ton was selected as a base case, based on a preliminary review of the parameters that would likely determine the economic viability of an underground mining operation at Banana Lake. While no current or historical underground uranium mine has operated at depths comparable to the Banana Lake deposit, the grade and volume of mineralized material identified in this deposit are significant enough to suggest that bulk extraction methods may be feasible, although further investigation is required to support this hypothesis.

The Mineral Resource estimates contained herein do not account for mineability, selectivity, mining loss and dilution.

The specific gravity ("**SG**") used by WGM to derive mass from the block volumes was constant at 2.85 tonnes/m^3 (or 3.14 tons/m^3) as provided by Appia Energy based on tests carried out at Actlabs. WGM has accepted this SG as an approximation as it compares favourably with those from similar deposits in the Elliot Lake area (and was the basis of WGM's 2008 resource estimate).

Pele's more extensive studies show that a value of 2.73 may be a more accurate SG value. This would result in a 4% reduction in the Mineral Resources reported herein. In turn, this suggests that more SG work should be conducted during subsequent drilling programs. Older core also could be tested to ensure that a representative selection of the different types of mineralization is covered.

17.3.7 MINERAL RESOURCE CLASSIFICATION AND TABULATION

WGM classified the Banana Lake Mineral Resource estimate as Inferred Resources. The following table summarizes the sensitivity of the Banana Lake Mineral Resources to cut-off grade (Table 29).

A single interpolation pass was used to establish grade and resource categories within each cut-off grade shell. A search ellipse (1,000 m in both the x and y directions, and 100 m in elevation) was used to categorize Inferred Resources. A minimum of five (5) and a maximum of six (6) composite samples were required for interpolation, with no more than five (5) originating from a single drill hole. Samples used for the grade interpolation were derived from a minimum of two drill holes to establish geological continuity.

To verify the block interpolation parameters, composites intervals were visually compared with block grades on both vertical cross sections and plan views. This comparison confirmed the continuity of grade both along strike, and down dip.

Table 29.
Banana Lake Mineral Resources Showing Sensitivity to Cut-Off Grade

Cut-off Grade ($lbs\ U_3O_8/ton$)	Inferred Resource		
	Tons ('000)*	Grade (lbs U_3O_8/ton	U_3O_8 ('000 lbs)*
0.40	51,527	0.668	34,424
0.50	42,149	0.823	34,684
0.60	**30,315**	**0.912**	**27,638**
0.70	24,520	0.922	22,602

* All tonnage and total lbs U_3O_8 amounts rounded to nearest thousand or thousandth. Totals may not add up due to rounding. The reader is directed to qualifying notes in Table 23, p. 158 for reference purposes.

All resource blocks within a 280 m radius of the drill holes were classified as Inferred (This radius corresponds to the radius of influence applied in WGM's previous resource estimate completed in 2008 (Workman and Vasak, 2008), and is just under half the distance between the two most closely spaced holes: holes BL-08-04 and Bl-08-03). Also, a straight line connecting the outer perimeters of the 280 m polygons was drawn to delineate the extents of the resource, as shown in Figure 18. Table 30 contains a summary of the Mineral Resource estimate.

Table 30
Banana Lake Mineral Resources
(using 0.6 lb U_3O_8/ton cut-off)

Category	Tons ('000)	S.G. (tons/m^3)	lbs U_3O_8/ton	Total lbs U_3O_8 ('000)
Inferred Resources	30,315	3.14	0.912	27,638

* All tonnage and total lbs U_3O_8 amounts rounded to nearest thousand or thousandth. Totals may not add up due to rounding. The reader is directed to qualifying notes in Table 23, p. 158 for reference purposes.

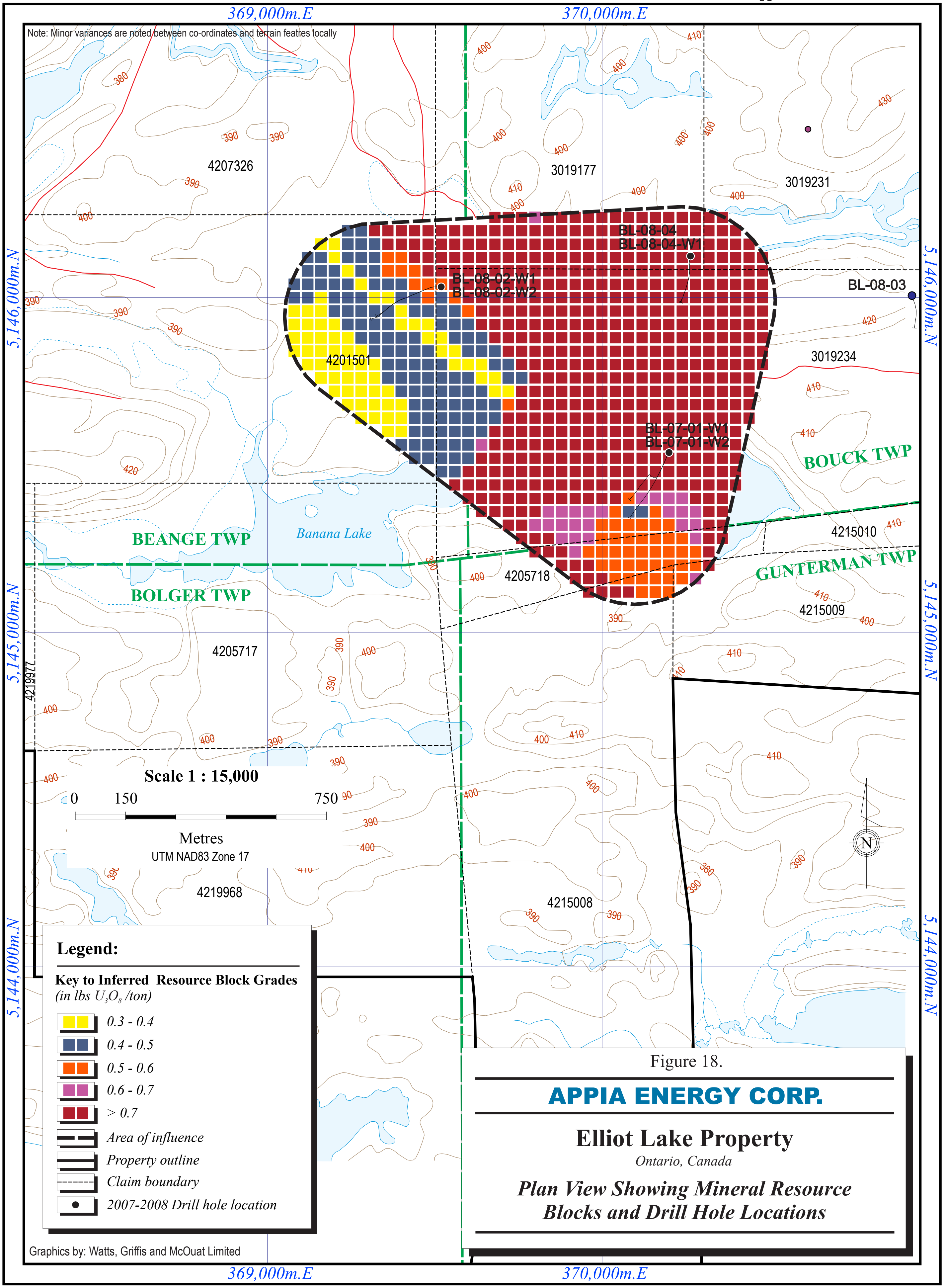


Figure 18.

APPIA ENERGY CORP.

Elliot Lake Property

Ontario, Canada

Plan View Showing Mineral Resource Blocks and Drill Hole Locations

17.4 ESTABLISHED HISTORICAL PRACTICES

WGM was unable to find information concerning resource and reserve estimation practices in the Elliot Lake mines. A document was reviewed concerning the practices used at the Agnew Lake Mine where "geological reserves" were calculated using a cut-off grade of 0.75 lbs U_3O_8 per ton (0.38 kg/t). "**Proven Reserves**" were restricted to reserves located within 200 feet (61 m) of underground workings and were developed on two or more sides (Agnew Lake Mines, 1980). "**Probable Reserves**" were uranium-bearing beds located within 200 ft (61 m) of workings, but were only developed on one side, or alternatively, were uranium-bearing beds with drill hole intersections less than 400 ft (122 m) apart. "**Inferred Reserves**" were defined as uranium-bearing beds with drill hole intersections greater than 400 ft (122 m) apart.

WGM is of the opinion that the foregoing classifications correspond to the CIM-equivalent definitions for Proven Reserves, Probable Reserves and Inferred Resources. WGM's discussions with former Elliot Lake mine workers, Bob MacGregor and Alan MacEachern, lead it to conclude that similar estimation practices were used for the Elliot Lake mines. The reliance on data from widely spaced drill holes was common practice at the time, and supported by the uniformity of the ore and its stratiform character. WGM is of the opinion that the aforementioned spacing of data points adequately supports the foregoing classifications given the excellent grade and thickness continuity of the Elliot Lake ores.

Although WGM has not seen specific mention of a dilution grade used for the conversion from geological reserves to minable reserves, a document by Agnew Lake Mines Ltd. concerning the methods used in the reserve calculation, dated 18 January, 1980, indicates that the practice at the Agnew Lake Mine was to use a zero grade for dilution purposes (Agnew Lake Mines, 1980). According to MacEachern, the grade of the hanging wall (HW) and footwall (FW) dilution at the Denison Mine ranged from 0.00 to 0.60 lbs U_3O_8/ton depending somewhat on the lithology of the wall rock. The amount of dilution from the hanging wall HW + FW depended on the particular reef(s) being mined and the mining method used, with 10% being an overall average (total). The grade of the dilution at Denison ranged from 0.00 to 0.60 lbs U_3O_8/ton depending somewhat on the lithology of the wall rock. In respect to current exploration targets, room and pillar mining of the >6 m Lacnor Reef would allow for dilutions of approximately 5 - 7% whereas mining of the 1.7-3 m thick (say) Teasdale Lake Zone would necessitate higher dilutions.

18. ENVIRONMENTAL

WGM believes that a review of the current status of environmental restoration and impact mitigation activities in the Elliot Lake is needed to ensure that Appia is fully informed regarding the potential collateral costs of mining in this area.

Approximately 2 years after the start of mining termination operations in the Elliot Lake camp, the Atomic Energy Control Board ("**AECB**") decided in October 1992, that proposals submitted by Rio Algom Limited and Denison Mines Limited for decommissioning several sites should be referred to the Minister of Environment Canada for public review. At this time, the decommissioning of mining projects was becoming more and more of a concern due to escalating costs to the Canadian public for the clean-up up of "heritage" sites. Given the fact that the Elliot Lake projects involved uranium, a commodity that was enshrouded in political intrigue and a certain degree of societal fear, and the newness of the public review process, the decommissioning of the Elliot Lake uranium tailings was foreseen as a major undertaking.

Plate 17: Aerial views of the Denison Mine before and after reclamation (from Canadian Nuclear Safety Council.

In hindsight, the engineering of the decommission process appears to have reflected a desire to eradicate any memory of the previous mining at Elliot lake without any regard to the value of the remaining uranium resource, and without any consideration for the future development of this resource. In today's context, this approach seems short-sighted, however the author of this report vividly remembers the atmosphere prevailing at the time as one of relegating Elliot Lake to the past and looking towards the future through developments in the Athabasca Basin, Saskatchewan.

During early 1993, the terms of reference and operating guidelines for the review were proposed and a review panel was established. In recognition that the Ontario Government had accepted the responsibility for environmental remediation work at many of the Denison and Rio Algom mines[14], the review was limited to Denison's proposal to decommission its Denison and Stanrock mine tailings facilities and Rio's proposal to decommission its Quirke and Panel mine tailings facilities.

By October 1993, draft guidelines had been issued by the panel for the preparation of Environmental Impact Statements (EIS). These require a description of the existing Elliot Lake tailings management areas, the proposed method for long-term management of the tailings, and the potential environmental and health impacts of these proposals.

An EIS was expected early in 1995 from each of Denison and Rio Algom. Intervener Funding was provided to various public groups to allow them to adequately prepare and present input into the environmental review process. In addition to the release of radioactive nuclides such as radon and radium, one of the major concerns was the potential for acid generating tailings and waste to contaminate the local watershed. Some of the other concerns were as follows:

- drying of the tailings and contaminant dust generation;
- uncovering and oxidation of the tailings and resultant acid generation;
- water containing solubilized heavy metals seeping out and entering the Serpent River water system, and related impacts on water quality, sediments and fish; and,
- excessive inadvertent exposure of intruders, human and wildlife, to gamma radiation from tailings surfaces.

In the case of tailings treatment, water cover to a minimum depth of 5 cm was seen as an important means to prevent dust generation and oxidation. According to Health Canada,

[14] As the mining operations drew down economically exploitable resources, it was apparent that only the high prices negotiated under long term sales agreements with Ontario Hydro could keep the Elliot Lake mines in operation. Public pressure forced Ontario Hydro, an Ontario Crown Corporation, to exercise options to terminate its contracts with Denison and Rio Algom. In exchange, the Ontario Government agreed to assume the responsibility for site remediation work at several, but not all, of the former producers' mines.

predictive modelling suggested a need for the sites to be monitored for the next 1,000 to 10,000 years beyond the present based on the long term radiological impact of the tailings, primarily driven by the 1,600-year half life of Ra-226.

Health Canada issued a summary of its finding in a summary document entitled "Decommissioning of the Quirke/Panel & Stanrock/Denison Uranium Mine Tailings Management Areas in Elliot Lake, Ontario". It contained the following statement dated November 16, 1995 by Mr. David Grogan of Health Canada:

> "Based on facility design and expected performance, chemical contaminants are not expected to be an issue. While some exposure parameters (e.g. drinking water consumption, air intake, fish consumption) are not properly used, they do not appear to impact negatively on the choice of the decommissioning option. The conclusion that chemical contaminants are not an issue is dependent upon the facility operating as expected. Monitoring of the performance is essential to ensure water quality is not adversely impacted. No significant radiological impacts are anticipated from the decommissioning options chosen by the proponents."

The Elliot Lake environmental assessment panel submitted its recommendations to the Federal Government during June, 1996 concerning the plans by the two mining companies to decommission the mill tailings sites. The panel agreed with the decommissioning proposals set out by both companies. The review panel recommended certain conditions for closing and reclaiming the Quirke, Panel, Denison and Stanrock tailings facilities.

Nearly a year later, in April 1997, the Federal Government agreed that the proposals submitted by Denison and Rio Algom, and the panel's recommendations should form the basis of the decommissioning licences for the uranium waste management areas. Approval was recommended for the licensing process to proceed, and at the end of the year decommissioning was proceeding at the specific sites in compliance with regulatory guidelines.

Decommissioning operations occurred from 1990 to 1998, and by late 1999 the major site decommissioning and reclamation work on the Rio Algom facilities (Stanleigh, Quirke, Panel) and the Denison facilities (Stanrock/Can-Met, Denison) was essentially completed. Waste management and tailings management areas were stabilized, and most have been flooded (tailings at Stanrock were saturated to reduce acid generation but have a dry cover). Planned interim monitoring and active management will be maintained until the effluent meets discharge criteria without treatment. At that time, the sites will enter into a phase of long-term monitoring with care and maintenance.

During April 1999, the AECB amended the decommissioning licences for the Denison and Stanrock mines to expand the site boundaries to include areas identified in 1998 that exceeded the clean-up criteria established for the two sites.

In addition to the Rio Algom mines covered under the AECB decommissioning licence, the Spanish American, Milliken, Lacnor, Nordic, Buckles and Pronto Mine facilities were not licensed for remedial action. These facilities were licensed by Rio Algom during 1995 to meet AECB requirements to control radioactive materials. Rio Algom submitted an environmental assessment report in 1999 that was reviewed that same year. During 2000, a revised report was expected to be submitted to the AECB with licensing approval expected later that year.

Rio Algom and Denison Mines are also monitoring the Serpent River and its watershed to assess the environmental impacts of their operations and tailings facilities on the entire Serpent River system. Up to the end of 2004, Denison and Rio Algom have committed over $75 million to decommissioning and waste management. Periodic sampling is carried out of background and receiving waters, as well as studies every five years on the biota in the watershed and the man-made tailings environments. Water quality monitoring is on-going. Collective annual costs to Denison and Rio Algom for these activities are approximately $2 million.

The first of the five-year biota assessments was completed in the fall of 1999 and a report was issued in 2000. The biological activity shows that the decommissioning efforts have been successful. Near-field environmental impacts on the watershed were detectable, as expected, in the form of above-background levels of salts, total dissolved solids and some metals. Nevertheless, the local fish, benthic invertebrates and wildlife displayed no adverse effects. The second stage of data collection was completed during 2004 and a report summarizing the findings was released in 2005.

The sustained effort to restore the Elliot Lake watershed to its original condition has been costly for all concerned. Any mine development activities by Appia should be undertaken in this context. While the previous mine sites represent areas already impacted by industrial activity, new mine development will likely draw attention which may be disproportionate to the impacts contemplated by mine planners. First Nations communities that are located in watersheds down-stream from mining operations may spawn groups that are especially resistant to uranium mining. Alternatively, Appia's engagement of such groups may define substantial grounds for co-operation since the previous mining activities have not produced adverse health consequences although there have been unsubstantiated claims to the contrary.

Notwithstanding opposition to a renewal of uranium mining in the Elliot Lake area, many of the residents of Elliot Lake may in fact welcome the industrial activity as a means of increasing property values and stimulating the local economy. The overall success of the site restoration and impact mitigation work carried out by the Province and by the miners should be seen as clear evidence that impacts can be managed in an environmentally responsible manner. Careful and enlightened interaction between company representatives and the public is required. The Canadian Nuclear Safety Council, in considering Rio Algom's application concerning consolidating the site management under its existing Waste Facility Operating Licence, chastised Rio Algom for not doing enough to keep the Public informed of its activities (Canadian Nuclear Safety Commission, 2004). Rio Algom has responded with bus tours of the sites several times a year and biannual inserts in the local newspapers up-dating the community on its efforts.

As of the date of this report, Denison and Rio Tinto maintain a joint webpage at http://www.denisonenvironmental.com/en/rehab/index.htm which is a community outreach program to provide information on the history and rehabilitation of the former uranium mine sites in the Elliot Lake area. According to information on the site, the goal of the project is "to inform the public and interested stakeholders on the progress that has been made in the rehabilitation of the former mine properties of Elliot Lake and to report on the monitoring and maintenance activities through publishing of the annual reports".

Clearly, future uranium production from this area will require an inclusive approach that builds upon the experiences of the past. There is no compelling environmental reason why uranium mining cannot resume in the Elliot Lake area and indeed the local community would most likely welcome the employment opportunities that such activities would bring. This view has been echoed to some extend by officials in the Ontario Ministry of the Environment. Appia should explore alternatives to conventional surface milling and processing that would allow sub-surface leaching as was used in the past and/or back-filling mine openings with tailings.

19. OTHER RELEVANT DATA AND INFORMATION

19.1 A HISTORICAL SNAPSHOT OF CANADA'S URANIUM INDUSTRY

WGM believes that a review of Canada's energy history, especially as it applies to the commodity market for uranium, is a fundamental component of understanding the underlying dynamics of uranium pricing. The uranium market has and continues to be very politicized, but it is difficult to imagine the actual forces and nuances by which the market has developed. The surging market for the metal seen in 2006 and 2007 was very similar to that which existed 40 years earlier. The international reaction to the disaster following the Japanese tsunami is uncannily similar to that which followed the Three Mile Island accident, though the scale is hardly comparable. Other aspects of the uranium industry are very different. With some knowledge of the historical legacy comes some understanding of the current potential for escalating prices in the uranium market which are of vital importance to projects such as that envisioned by Appia.

It was not until 1948 that the prospecting for uranium by private individuals and companies was encouraged. The government of the day established a policy revoking previous Crown control over uranium prospects and guaranteeing a minimum price for acceptable uranium ores[15]. The new policy constructed a basis for government purchases of uranium through Eldorado Mining and Refining Limited ("**Eldorado**"), a Crown corporation. It specified, among other criteria, that the purchase price would be based upon the uranium content of the ores and would be at the minimum rate of $2.75 per pound of contained U_3O_8, and the price being guaranteed for a period of five years. This was the first of many such actions that the Canadian and other governments would be forced to take to support their domestic uranium producers.

As a result of the removal of restrictions on private prospecting, more than 10,000 new radioactive occurrences were reported to the Atomic Energy Control Board of Canada by 1956. The deregulation of the industry combined with long-term supply contracts with the United States of America ("**US**") encouraged this exploration, however, the discoveries came just as the US announced plans to begin restricting the import of foreign uranium. At the time, the US accounted for 90% of Canada's uranium market, the balance being provided to the UK. During 1959, the Government of Canada approved new agreements between Eldorado and the US Atomic Energy Commission ("**AEC**") as

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[15] In a statement in the House of Commons on March 16, 1948, C.D. Howe announced details of the new government policy

well as with the UK Atomic Energy Authority ("**AEA**") designed to strengthen the position of the Canadian uranium industry. The new agreements were completed in advance of the termination of the existing contracts, allowing delivery of Canadian uranium to the US into 1962, after which the US would not allow additional imports. It is noteworthy that significant discoveries of uranium were made in the south-western US at this time. Pressed by the Canadian Government, the US agreed to extend the delivery of Canadian uranium through 1966 in recognition of Canada's vital role in meeting urgent US military requirements when the supply of uranium was scarce in the 1950s. Under this plan, deliveries of uranium to the AEC and the AEA were scheduled at 9,718 tons of U_30_8 during 1961, gradually reducing to 1,100 tons in 1966.

Canadian uranium output peaked in 1959 when 23 operating mines produced 15,892 tons of U_30_8 valued at $331.1 million, making uranium Canada's fourth largest export commodity. Nearly 75% of this production came from underground mines at Elliot Lake, Ontario, with most of the balance being produced from mines in the Beaverlodge area of northern Saskatchewan[16]. By 1968, Canada's uranium production had declined to a low of 3,701 tons, from only three mines, following which there was a slow recovery to 7,150 tons by 1980. At this time, the weak uranium market caused the Canadian Government to initiate research into alternative, non-nuclear uses for uranium, including its use in improving the high temperature properties of certain specialty steel and brass alloys. It was during the late 1950s and early 1960s that CANMET, a part of the Department of Mines and Technical Services, now under Natural Resources Canada, carried out research of beneficiation procedures for the recovery of uranium including flotation procedures in mills. CANMET also pioneered research into the use of bacterial leaching as a means of recovering uranium from broken ore, a production technique later used by both Elliot Lake producers Denison and Rio Algom.

During July, 1963, the Canadian Government initiated a program of uranium stockpiling to stabilize employment in the industry. Forecasts at the time suggested that a return to full production might occur if civilian reactor construction was initiated to meet growing energy demands. Although implemented as a short term solution, the program was twice extended, the latter period of stockpiling being extended to 1974. The main beneficiaries of the program, which included a base price of $4.90 per pound of U_3O_8, were Denison Mines Ltd. and Rio Algom Ltd. operating in Elliot Lake, and Faraday Uranium Mines Ltd. operating in Bancroft. The first stockpile consisted of 5.4 M lbs of U_30_8 and the

[16] Other production came for Port Radium on Great Bear Lake and relatively minor production was realized from mines in the Bancroft area of south-central Ontario.

second accumulated 13.9 M lbs of U_30_8 [17]. At the same time, the Government also announced a policy that uranium export permits would only be granted to Canadian producers if the buyer guaranteed that the Canadian uranium would be used for peaceful purposes, a policy that exists to this date[18].

Despite the removal of the US as a purchaser of Canadian uranium and the decline of uranium production to a low of 3,701 tons of U_30_8 in 1968[19], the UK continued to purchase uranium from Eldorado at a base price of $5.03 per pound through the 1970s. As a means of further stabilizing prices and avoiding further reductions in the level of employment and production, the Canadian Government authorized exports of uranium for the accumulation of stockpiles in the importing country. Although this was seen as detrimental to the industry in the longer term, it was hoped that the construction of new reactors would quickly reduce the size of the accumulating stockpiles. The floor price of $4.90 per pound of U_30_8 was maintained. Normal trade channels were encouraged for sales from the stockpile which would generally be made at prevailing market prices. It was hoped that maintaining the industry would avoid a repeat of the rapid run-up in uranium prices and subsequent crash that was observed in the 1950s.

Even though uranium production had fallen to a new low by the end of 1966, there was a conviction in Canada and in other countries that the uranium industry was on the verge of entering a new period of development. Non-communist nuclear plant capacity was predicted to be about 225,000 MWe by 1980, requiring 65,000 tons of U_30_8 per year to provide the necessary fuel to support that capacity[20]. Delays and cancellations of plants during the 1970s resulted in a demand of only 39,000 tons of U_30_8, or about half that forecast. Market growth continued, however, largely based on additional contracts with UK, Japanese and West German power utilities.

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17 According to NRCan, purchases for the first stockpile totalled 2,680 tons of U_30_8 costing $24.4 million.

18 Canada was a founding member of the International Atomic Energy Agency, and despite the initial military use of Canadian uranium by both the US and the UK, non-proliferation and the peaceful application of nuclear technology had become a fundamental part of Canada's international policy

19 The previous peak in annual production was 15,892 tons of U_30_8 during 1959.

20 In December, 1967, the European Nuclear Energy Agency and the International Atomic Energy Agency jointly published an estimate of world uranium reserves showing that Canada, South Africa, and the United States controlled almost 85% of the 700,000 tons of uranium oxide as reasonably assured reserves available in the non-communist world, and recoverable at prices up to $10(US) a pound Of U_30_8.

NRCan reports that in October, 1968, Rio Algom announced that it would spend $26 million in the Elliot Lake area re-activating its mining operations, a sign of improved prospects for the uranium industry. Exploration activity in Canada in 1968 exceeded levels reached in the peak years of the 1950s, a further sign of improved prospects.

In November 1967, in an atmosphere of heightened optimism, the Government of Canada proposed new policy guidelines directed at increased scrutiny and control concerning the allocation of uranium exports to foreign countries, together with a system to maintain adequate reserves and production capability to meet foreseeable domestic requirements. A month later, the US imposed an embargo on the delivery of foreign uranium to its enrichment plants where the enriched material was intended for use in US nuclear facilities. Eight years later, the US AEC announced that the embargo would be lifted in stages beginning in 1977. The effect on the recovering Canadian uranium producers was significant.

During the late 1960s, as at the present, energy policy matters were key subjects of discussion between the US and Canada. Under US pressure, Canada had agreed to limit its oil exports to the US in order for the US to maintain its own oil pricing structure. This policy was not greatly different from policies later invoked to protect the US domestic uranium producers. Canada, on the other hand, argued for an open trade policy that would benefit consumers.

On June 19, 1969, the Minister of Energy Mines and Resources (EMR, Canada) announced a detailed policy in respect to future export sales of uranium, further to the 1965 policy which had provided for increased scrutiny. EMR noted a growing world requirement for stable assured supplies of uranium for energy production. The new policy specified that all contracts covering the export of uranium or thorium, including the contract pricing terms, would be examined and approved by a Federal agency prior to the granting of an export permit. Approval would not normally be given to contracts of more than 10 years duration unless provision was made for the renegotiation of price, and export permits would be issued annually provided that the conditions of the contract had been maintained.

Against the backdrop of the US restrictions on Canadian oil to support its own policies, the Canadian Government formally requested the US Government to remove its embargo on the importation of Canadian uranium for US consumption. Canada considered this policy to be a contravention of the General Agreement on Tariffs and Trade (GATT). Since its imposition, Canada had been denied access to over half of the free world's uranium market. In 1969 Canada's uranium industry was operating at about one-quarter of its 1959 peak production level. In this political environment, western Canadian oil producers were pressing for greater markets in eastern Canada due to the restrictions on exports of Canadian crude oil to the US.

In an increasingly gloomy market for both Canadian oil and uranium producers, the Government was forced to reassess the future energy production outlook for Canada. In exchange for an agreement limiting Canadian oil exports to the US to a maximum average rate of 440,000 barrels a day, the Government of Canada was prepared to discuss possible arrangements for freer trade in natural gas, uranium, coal and electricity. However, over a strong official expression of regret by the Canadian Government, the US imposed mandatory oil quotas on Canada at a level much below that proposed. On 10 March, 1970, a Presidential Proclamation was issued to restrict the flow of Canadian oil into US markets. The completion of a pipeline into Chicago had allowed Canadian exports in the first quarter of 1970 to rise to a level 25% above the maximum level mandated by US restrictions. Interestingly, liquid hydrocarbon production in Canada of 1.48 million b/d during 1970 equalled domestic demand for the first time in the history of the industry making Canada self-sufficient.

During March, 1970 the Canadian Government decided that foreign ownership in the Canadian uranium industry would be restricted to a maximum holding of 10% of the outstanding shares of any existing uranium company; and, in the case of aggregate foreign ownership, a maximum holding of 33% of the outstanding shares of any existing company. The Prime Minister announced that legislation would be introduced, if necessary, to stop the sale of the control block in Denison Mines Limited by resident Canadian owners to a foreign buyer. These rules and regulations were enacted under the Atomic Energy Control Act.

On 23 December, 1970 the Minister of EMR and Denison Mines Ltd. announced agreement in principle of a joint venture uranium stockpile program designed to ensure the basic economic security of the Elliot Lake community in which Denison was a major employer. The Government had supported the mining industry in Elliot Lake since 1963 with stockpile programs in which Canada had been the outright purchaser of $100 million of uranium concentrates. The new joint venture stockpile agreement represented a 75%-25% Federal-Denison commitment to purchase 6.5 Mlbs of uranium concentrates at $6.00 per pound to thereby carry the Elliot Lake community and Denison through 1974.

Coinciding with increased energy concerns, the Federal government entered into an agreement to financially support rehabilitation of the heavy water plant at Glace Bay, Nova Scotia, such investment to be recovered over a period of time. The Crown corporation Uranium Canada was also established reflecting the importance attached to the domestic uranium industry by the Canadian government.

In January 1972, international consideration was given to means by which the market price for uranium might be improved through a meeting of Canadian, French and Australian officials. A meeting of uranium producers, called by URANEX of France, was scheduled for February, with representation from Canada by an official of Eldorado Nuclear Ltd. During April, Canada was assessing broad policy alternatives relating to domestic control of the national economic environment, as well as proposed legislation relating to policy objectives in the uranium sector, a concern as a result of declining uranium exploration activity, a direct result of depressed prices.

In August, 1972 the Government issued a directive to the Atomic Energy Control Board ("**AECB**") concerning minimum selling prices for uranium and volumes of sales to export markets as a means of stabilizing uranium markets and promoting the development of the Canadian uranium industry. This effectively extended domestic policy into the export market. An export permit would not be granted unless the AECB was satisfied contract terms met pricing requirements and the quantities sold were in the public interest. The OPEC-led oil shocks during 1973 and 1974 led to a Federal Government review of Canada's energy requirements, its announcement that it was prepared to participate in the construction of uranium enrichment facilities provided the projects optimized the use of uranium and provided they gave maximum benefit to Canada.

During August, 1973, Uranium Canada acted on behalf of the Government to sell 1,000 tons of U_30_8 to Japan from the government-owned stockpile and from the Government-Denison joint venture stockpile, with delivery to take place over the period 1977-81. This represented about 7.5% of the accumulated stockpile.

In January, 1974, the Canadian Government announced that Eldorado Nuclear Ltd. would be provided with funds to finance an exploration program in Canada in addition to maintaining its key role in refining and marketing uranium. This met some criticism from exploration companies in the belief that Eldorado's position gave it an unfair advantage in competing with the Private Sector. Nevertheless, the Government's view was that uranium was too important to Canada's energy future to trust it solely to private companies, many of which had foreign parents or were in joint ventures with foreign-owned companies.

In March, 1974 the Federal Government approved in principle the terms of the uranium marketing arrangement agreed to among international producers at Johannesburg in January, 1974 whereby the quota period for uranium marketing would be extended to 1981-83. This was the first clear evidence that a cartel had been formed to act proactively in stabilizing uranium prices given the exclusion of these producers from the US market.

During 1974, the Uranium Resources Appraisal Group (URAG) was established to undertake annual assessments of Canada's uranium resources, and to officially determine the domestic reserves of each Canadian producer. A new uranium export policy was subsequently announced providing for protection of uranium reserves for the domestic market. Further processing requirements were defined and a new stockpile policy was announced.

During a March, 1975 meeting between Canadian and US officials, the US government accepted the need for Canada to reduce its oil exports to the US in order to satisfy domestic requirements, however the US expressed serious concern and strong resistance to any reduction of natural gas exports. At that time there was evidence that conventional gas reserves in Canada were declining and that the level of exports could not be maintained. The Canadian position on energy management was also present in the form of policies enacted under the Foreign Investment Review Act whereby any foreign company that was not exploring for uranium in Canada prior to October, 1975 was to be reviewed by the Government to determine if its proposed exploration programs significantly benefited Canada.

In June, 1976, the Canadian Government announced revised uranium resource estimates in a report entitled “1975 Assessment of Canada's Uranium Supply and Demand”. Using a maximum price of $40 per pound of U_3O_8, total economically recoverable resources were estimated at 562,000 tons of U_3O_8, an increase of 7.8% from the 1974 estimate, and largely due to new high-grade discoveries in the Athabasca Basin of northern Saskatchewan. During August, 1976 the Federal government entered into shared-cost agreements with New Brunswick, Ontario, Saskatchewan and British Columbia under the Federal-Provincial Uranium Reconnaissance Program to accelerate exploration for uranium. The program was designed to provide industry with data on areas most likely to contain new uranium deposits, and to provide information to the provincial governments to help them in assessing total Canadian uranium resources.

During the final month of 1976, the Canadian Government decided that new uranium sales abroad should be made at prevailing world prices, with provisions for an escalating floor price and annual negotiation of prices. The active support of the uranium producers cartel would be somewhat replaced with a policy encouraging Canadian producers to renegotiate existing contracts if selling prices were too low to provide a reasonable return.

At the end of June, 1978 the Government introduced the Uranium and Thorium Mining Review Bill in Parliament which had the purpose of ensuring at least 50% Canadian ownership in major resource industries, providing for tests concerning non-resident management and ownership related to shares held by non-residents. This effectively set qualification hurdles by which a company was deemed to be eligible to produce uranium in Canada. In the face of provincial opposition to their loss of control over resource development, the bill was never passed however its very existence further underscores the highly politicized atmosphere surrounding uranium production in the 1970s.

During mid-1980, the fifth annual assessment of Canada's uranium resources was published. Using two price categories -- up to $125/kg U and from $125 to $175/kg U - the total of the estimated resources minable at uranium prices of up to $175/kg U was 568,057 tons, expressed in the following resource categories[21]:

Measured	80,000 tonnes U	(208 million pounds U_3O_8)
Indicated	55,000 tonnes U	(143 million pounds U_3O_8)
Inferred	302,000 tonnes U	(785 million pounds U_3O_8)

Four years previously, the uranium resource had been estimated at 572,000 tons of uranium oxide in all categories using a price of $40 per pound. The decline of 0.7% can only be accounted for by the aggressive mining and resource depletion that followed the new discoveries made in the late 1960s and early 1970s, Rabbit Lake, Cluff, Key Lake especially, that had previously inflated the resource picture. The discoveries made between 1976 and 1980, significant as they were, had not kept pace with the mining of uranium resources.

21 Calculated in 1980, these uranium resources are of a speculative and historical nature and do not comply with National Instrument 43-101.

The price support mechanisms implemented by Canadian and other Governments had a profound effect in stimulating uranium exploration and mining. Although the effects of over-stimulation were recognized well in advance, and the accumulating global stockpile of uranium in various forms, mainly U_3O_8, was considerable, the rapid downturn in prices at the end of 1979 and the abandonment of Government support policies was not fully anticipated. Table 31 shows the current and inflation-adjusted realized price for uranium during 1976-99.

Table 31
Canadian Realized Export Price for Uranium Metal, 1976-99

Year	Average Export Prices (US$/kg U)				Spot Market Sales % of Deliveries
	Current Dollars		Constant 1998 Dollars		
	$/lb	$/kg	$/lb	$/kg	
1976	47.17	104.00	118.37	261.00	not reported
1977	49.89	110.00	117.46	259.00	not reported
1978	56.69	125.00	125.17	276.00	not reported
1979	58.96	130.00	118.82	262.00	not reported
1980	61.22	135.00	111.11	245.00	not reported
1981	49.89	110.00	82.09	180.00	1
1982	51.25	113.00	77.78	170.00	1.5
1983	44.44	98.00	68.03	140.00	10
1984	40.82	90.00	68.48	125.00	26
1985	41.27	91.00	64.85	123.00	20
1986	40.36	89.00	62.59	117.00	21
1987	35.83	79.00	60.77	99.00	35
1988	35.83	79.00	48.98	95.00	13
1989	33.56	74.00	38.55	85.00	<1
1990	32.20	71.00	35.83	79.00	<1
1991	27.66	61.00	29.93	66.00	<2
1992	26.76	59.00	28.57	63.00	<1
1993	22.68	50.00	24.04	53.00	<1
1994	23.13	51.00	24.04	53.00	<1
1995	21.32	47.00	22.68	48.00	2
1996	24.31	53.60	24.84	53.78	1
1997	23.27	51.30	23.17	51.09	<1
1998	23.17	51.10	23.56	51.94	<2
1999	22.27	49.10	22.27	49.10	<1

after Natural Resources Canada – WGM's inflation adjustment using Consumer Price Index, Statistics Canada.

The downturn in uranium prices accelerated as economic growth stalled under the weight of high interest rates in 1981-83, run-away Government deficits, and collapsing commodity prices. The end result of revised energy demand outlooks and cancelled or delayed reactor construction, the accumulated uranium stockpiles have taken more than two decades to consume. The net result has been depressed uranium prices at a level far below the cost of replacement although the realized prices achieved under many of the long term supply contracts resulted in blended uranium revenues significantly higher than the spot price prevailing during the 1980s and 1990s.

The 2006-07 rise in uranium pricing did not initially achieve much in the way of recognition as the increase was generally thought to be a minor 'blip' similar to that which occurred during 1995. However, the fundamentals affecting the uranium market were very different, mainly due to the consumption of the global stockpile, limited growth in uranium production, growing resistance to the conversion of highly enriched uranium ("**HEU**") to nuclear fuel, growing energy requirements in the developing world, and re-emerging demand for nuclear-electric energy sources in existing markets. Importantly, the international market is now largely unfettered from the political interferences and protectionism that prevailed earlier, and typified by US actions to protect its own producers. As this report is written, the US uranium exploration industry is largely owned by Canadian companies. Much has changed, and the market is the better for it. The current speculative participation of hedge funds in uranium purchases on the spot market, though a small portion of the overall market, has the potential to create volatility as seen during 2007 according to industry sources. The fall in term contract prices seen during 2008 and the partial recovery seen in 2009 indicates the true strength of the market which appears to be corrective in the range of $50 to $60 per pound of U_3O_8.

19.2 URANIUM PRICE OUTLOOK

During the previous uranium commodity boom, which started in approximately 1973, the highest Ux spot prices for uranium occurred between January, 1978 and November, 1979 with the price sustained above $43.00 per pound of U_3O_8 during that period (Figure 19). On the NUEXCO spot market, the same price peak occurred between February, 1978 and June, 1979. The highest monthly average price was $43.80 in February, 1979 on the Ux spot market, and $43.40 from May though July, 1978 on the NUEXCO market.

The average annual export price for Canadian U_3O_8 sales is shown in Table 31 (NRCan). These prices are derived from the average price for all deliveries made by Canadian producers to export customers in the given year (1 kgU = 2.60 lb U_3O_8). Pre-1996 prices are rounded to the nearest dollar. Constant dollar values are derived using the Implicit Price Index for Gross Domestic Product.

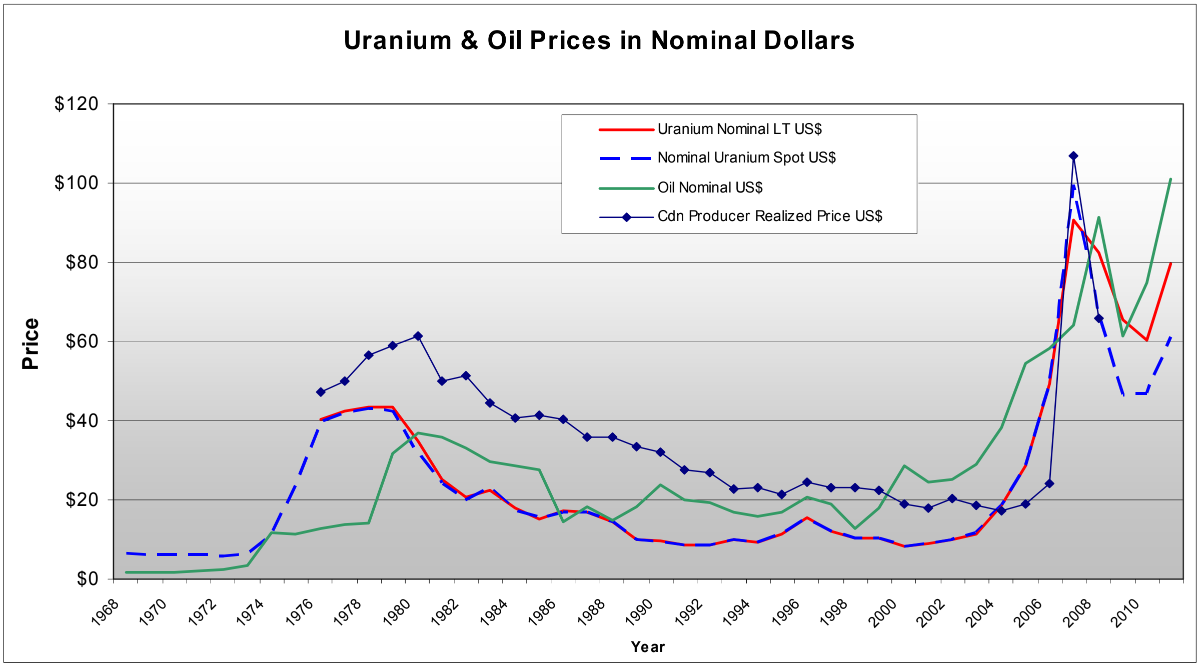

Figure 19 Graph of annual average spot and long term U_3O_8 prices against actual price received by Canadian producers and the annual average oil price. Data for 2011 is current up to mid-July. Although NRCan no longer publishes realized price data, evidence suggests producer are experiencing a robust recovery after the low of 2010.

The highest average annual price achieved during 1980, equal to approximately C$133 (US$116) per pound of U_3O_8 in 2006 dollars, was realized on the basis of contracts negotiated in previous years. The sales prices achieved for 1980 came two years after the peak spot price. The earlier negotiations occurred at a time when energy utility companies were deeply concerned about continuing price escalations. It is, however, noteworthy that spot market activity at the time of delivery accounted for only a very small fraction of total market sales, thus not truly reflecting the amount of uranium actually available in the market from accumulated stockpiles. It is also interesting that spot market activity did not significantly increase until into the third year of declining realized prices. Data in the foregoing table (Table 31) and Figure 19 also show how having long term supply contracts generally resulted in domestic producers being well protected, at least initially, from the slide in uranium prices that occurred during the early 1980s. The data also show that, despite the price drop following the tsunami-triggered Fukushima nuclear disaster in Japan, the average uranium price thus far in is 2011 remains well above the average price for 2010.

Figure 20 shows the foregoing chart adjusted for inflation using the Canadian consumer price index and using 2006 dollars. While the underlying data is the same as that used for the foregoing chart, the profound effects of the inflationary 1970s and early 1980s can be easily seen. In the knowledge that recent prices have risen above the inflation-adjusted prices of the late 1970s, the future will be interesting in respect to where uranium prices are headed, and the duration of this cycle.

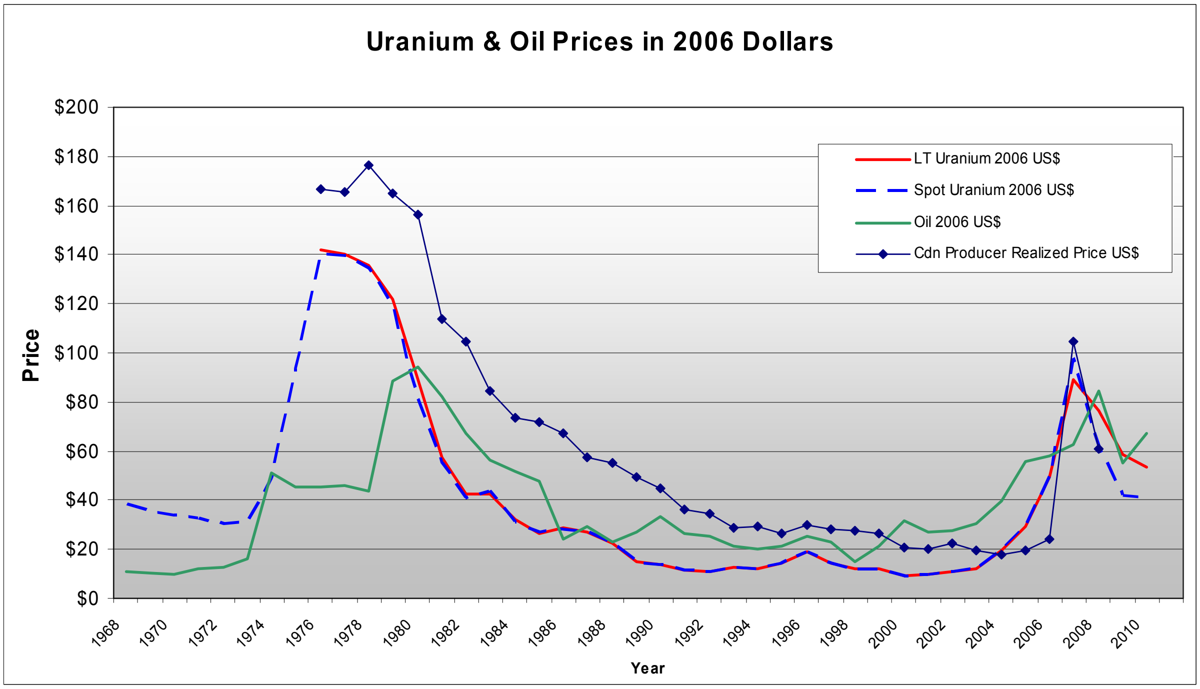

Figure 20 Uranium and Oil Prices in Constant 2006 Dollars

In September, 1977, the Uranium Institute, a body under the World Nuclear Organization, estimated that some 1.8 Mt of uranium were produced during the period 1946–1996 (Pool, 1997). Actual consumption for both civilian and military needs during the same period was estimated to have been about 1.0 Mt of uranium. Approximately 800,000 t of uranium was estimated to have gone into stockpiles. The historic decoupling of market price and metal inventories during the late 1970s was very different than recent developments in uranium markets which, in 2006, saw virtually no surplus inventory available. Serious shortages have been forecast by commodity analysts. No better confirmation of changing times was been the Russian contract of June 22, 2006, whereby Tekhsnabexport and the Russian-Kazakh-Kyrgyz uranium mining venture "Zarechnoye" signed a contract to enable the delivery of $1 billion worth of uranium to Russia between January, 2007 and 2022. The Zarechnoye project was expected to begin uranium production in the third quarter of 2006 at a design capacity of 1,000 tons of uranium (oxide) per year from a deposit estimated to contain 19,000 tons of uranium. In the project announcement, it is clear that Russia expects to receive as much as an additional 5,000 tones per year from Kazakhstan. The country increased its production by 26% in 2007 to 6,637 tonnes of yellow cake, up from 5,281 tonnes the previous year. Production is forecast at 30,000 tonnes in 2030. Given the degree of State control of the industry in Kazakhstan, which may conflict with the interests of foreign investors, it will be interesting to see whether these ambitious production targets can be achieved (MacLeod Dixon, 2008).

The uranium market environment that has witnessed a change-over of Russia from a major exporter of surplus uranium from its U_3O_8 and HEU[22] stockpiles, to a net importer must therefore be taken into consideration in order to have some understanding as to the potential for a project such as is envisioned by Appia. The growing needs of China and India will impact the uranium market as their demands have already affected the market for many other mineral commodities.

Any analysis of the uranium market must begin with an analysis of price trends. However, while the pricing of other mineral commodities is transparent due to the existence of metal retailers and a terminal market for which prices quotes are readily available, the pricing of uranium has commonly been determined in closed door negotiations between producers and energy utilities. WGM's review of information pertaining to the main Elliot Lake producers, Denison Mines Limited and Rio Algom Limited, revealed that the companies were willing to divulge delivery prices during the early 1960s, however this willingness apparently disappeared as prices escalated such that the companies only advertised sales volumes[23].

As non-transparent as the uranium pricing market became, it was also impossible to separate the market from politics. The Canadian Government developed its foreign ownership policy regulating the uranium industry and limiting the control of foreign governments through proxy companies. Perhaps the controls themselves created an environment in which contracts between the Canadian producers and European and Far

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22 HEU – highly enriched (weapons grade) uranium containing as much as 90% U_{235} in contrast with natural uranium which contains approximately 0.7% U_{235} and 99.3% U_{238}. Note that light water nuclear reactors require 3-5% U_{235} in contrast with CANDU reactors which accept uranium fuel in its natural isotopic ratios.

23 The lack of transparency in the uranium market was once more given force by a recent decision concerning uranium by the Canadian Government, namely: "commencing in 2002, Natural Resources Canada has decided to suspend the publication of the Average Price of Deliveries under Export Contracts for uranium for a period of three to five years, pending a policy review and assessment of market conditions" (NRCan website). WGM wonders about the motives for such decisions.

Eastern utilities seemed to use a wide range of delivery and ownership mechanisms. Canadian interests were materially reflected in the creation of Uranium Canada in 1971. The French uranium producer Uranex called Canadian, French and Australian government representatives to develop a means of improving the uranium market, and in August 1972, the Canadian government announced a regulation requiring all uranium exports to be reviewed to determine that the contracted pricing of uranium was sufficiently favourable to be in the National interest (NRCan Archives 2). According to NRCan archives, in March, 1972 the Canadian government gave its approval in principle to the terms of the uranium marketing arrangement agreed to earlier among international producers whereby the quota period for uranium marketing would be extended to 1981-83. This effectively established the "Uranium Cartel" which subsequently set a floor price and production quotas for uranium as a means of stabilizing prices.

The Uranium Cartel was much maligned during the late 1970s, especially by those who saw the heavy hand of Government conspiring with private companies to manipulate the price of uranium. Most Canadians had forgotten that the uranium industry, then a provider of cheap electrical energy, had been on the verge of bankruptcy less than a decade earlier. Canadian law mandated that Canadian producers participate in the cartel while at the same time US reactor manufacturer Westinghouse was suing US parent companies over the participation of their Canadian subsidiaries in the cartel. Forgotten was the fact that a few short years earlier, the US Government was manipulating both the oil and uranium markets to the benefit of its own producers. A near US monopoly on enrichment facilities was used as a means of driving Canadian and other foreign producers out of the market (Gray, 1982). All that made little difference when the existence of the cartel became known to US regulators in August 1976 with the leaking of the Mary Kathleen Uranium Company documents to US regulators. Nevertheless, the fact remains that the cartel was effective for only 18 months. The cartel first set minimum uranium prices following a meeting between the non-US uranium producing governments in Johannesburg on 29 May-1 June, 1972. After lifting the uranium price some $2.00 a pound by late 1973, free market forces pushed the price of uranium above the floor price established by the cartel (Gray).

Due to the price supports that dominated the market during the first uranium boom, it is difficult to assess current uranium pricing trends on a historical basis because so much has changed. The French marketing agency, Euratom, may provide useful estimates of annual average spot prices today. The difficulty is actually determining what contracts reflect spot market activity and which agreements represent off-spot market transactions. In a competitive market, uranium prices would be determined by short-term (spot) transactions since this best reflects the state of the market at any specific time. However in the uranium market, the spot price has tended to be the discount price which is certainly not the leading price, especially when prices are rising.

The gap between term contract and spot prices reflects persistent oversupply during the 1970s and 1980s. The difference between spot and contract prices was at its smallest during 1980. It decreased temporarily in 1997 and again in 2004. During mid-2007, spot prices were approximately $30 higher per pound of U_3O_8 than the term contract price, an inversion that WGM attributed to the absence of substantial quantities of new uranium available for long term supply, and thus a simple lack of long term contracts to set a new benchmark price. The speculative participation of hedge funds in buying up the available uranium is seen as a catalyst to the most recent price run-up. Interestingly, as uranium prices recovered during the period November, 2010 through January, 2011, the spot and term prices again inverted with the discount price up to $5.00 more per pound than the $65 term price. In this case, however, the term price rose to match and briefly exceed the discount price before the fall-off experienced in mid-March as a result of the tsunami in Japan.

Following the accumulation of military stockpiles of uranium during the 1950s, uranium prices drifted lower as civilian reactor construction did not take off as quickly as had been anticipated. Following the run-up in uranium prices during the early to mid-1970s, largely the result of the oil shocks and reactor construction and perhaps the limited effectiveness of the Uranium Cartel, the general trend of prices was downwards after 1978. Average contract prices lagged behind for the aforementioned reasons, however the stockpiles that accumulated during the 1960s and throughout the 1970s and early1980s created a massive overhang on the market. This over-supply of uranium was further exacerbated by the conversion of weapons grade (HEU) uranium stockpiles into nuclear fuel during the 1990s. Russia was a major supplier of HEU to western markets, chiefly through Cameco Ltd., the Canadian uranium producer and fuel fabricator.

The result of stockpile drawdown was a low but relatively stable price regime for uranium during the latter part of the 1980s and the 1990s. A short-lived price rally occurred between September 1994 and June 1996 when prices rose from US$9.10 per pound of U_3O_8, peaking at US $16.60 per pound (+82%), but this rally subsided to previous price levels (Ux and NUEXCO). Increasing oil prices at the time may have been a catalyst for the uranium market. While the general lack of volatility and low prices may have been viewed as good for energy consumers and the nuclear energy utilities in the short term, few paid any attention to the significant draw-down of international stockpiles and the effect that protracted low prices were having on the uranium exploration sector. Interestingly, Russia has announced that it is not planning to extend the HEU Agreement with the US, the terms by which the US agreed to purchase at least 5.5 million SWU[24] annually derived from approximately 30 metric tons of HEU (USEC 19 June, 2002). Russian Government spokesmen have stated that commitments under the existing agreement will be fulfilled through to the expiry date in 2013, and that over 250 tonnes of HEU had been converted as of 15 July, 2006. Some negotiations have opened the possibility that the current agreement between the US and Russia may be extended beyond 2013 for a variety of energy and security-related reasons, however nuclear fuel supply bottle-necks currently exist in the form of shortages in fuel fabrication facilities (Holgate, 2008).

The price rise of the mid-1970s and the current rise has been associated with periods of escalating oil and gas prices. This is clear from the foregoing figures, although oil price peaks are commonly offset from uranium prices.

Perceptions of the direction and extent of price movements differed in the early 1980s, and again in recent years, when viewed in the different currencies. The current increase in the price of uranium must be discounted somewhat because of the eroding value of the US dollar. In reality, therefore the current price of uranium should be reviewed against a basket of currencies including the Canadian dollar, major European currencies and eastern currencies, especially the Japanese Yen. While WGM has not carried out this type of review, it seems logical that the recent erosion of US dollar purchasing power implies that uranium remains relatively cheaper in many foreign currencies. Nevertheless, in any real terms, currency price fluctuations have little impact on the uranium fuel operating costs of power reactors.

Having invested time and tremendous capital in constructing a power reactor, energy utilities are mainly concerned about nuclear fuel supply rather than price risk. Various estimates exist as to the impact of fuel costs on the economic viability of nuclear reactor, however there is a general consensus that costs between \$200 and \$500 per pound would be sufficient to negatively affect decisions regarding reactor construction. In the current pricing environment this appears to allow sufficient room for prices to increase significantly from present levels.

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24 A Separate Work Unit ("**SWU**") relates to the effort required to produce enriched uranium (4-5% U^{235}) for light water reactors. A typical 1,000 MW reactor requires approximately 100,000 SWU of enriched uranium for a year. A 1,000 MW plant can supply the electricity needs for a city of about 600,000.

One factor which will impact uranium prices in the future will be new sources of supply that will emerge as a result of:

1) the current up-swing in global uranium exploration activity; and,
2) movements by the Federal Government of Australia to encourage an expansion of uranium mining in that country from its many known deposits and growing public acceptance of uranium mining as a relatively "green" energy alternative to coal.

Recent discoveries by uranium explorers will add new supply to the market which will likely continue over the next decade. This is occurring both in established camps, such as several recent discoveries in Canada's Athabasca Basin, and in emerging areas such as the Dornod Deposit being developed by Khan Resources in Mongolia (4-5 M lbs U_3O_8 per year for 10 years). Kazakhstan remains a major producer with ample opportunity to increase its output. Intensive exploration activity in Canada is expected to result in new discoveries as well as the possible reactivation of some historic mining camps such as those near Uranium City, Saskatchewan and in Ontario in the Blind River and Bancroft areas. However, serious supply disruptions such as the flooding of the Cigar Lake Mine and the hoist accident at the Olympic Dam Mine, can also take expected supply off the market.

Until recently Australia upheld its Three Mine Policy initiated during the late 1970s, a law initiated by a national Labour government and vigorously pursued by the various State governments that limited the country's uranium industry to a maximum of three operating uranium mines at any one time. The position of the Federal Government softened some time ago as it became clear that nuclear energy offered an increasingly greenhouse gas conscious world a source of relatively clean energy, notwithstanding environmental concerns related to the disposal of mine tailings. South Australia, with its giant Olympic Dam copper-uranium-gold deposit, was the first state government to move forward, permitting Australia's fourth uranium mine, SXR Uranium One's Honeymoon Mine, an in-situ leach operation (400 t U_3O_8/year for 7 yrs). BHP Billiton Ltd., the owner of Olympic Dam, has announced plans to triple the mine's output of uranium oxide to 15,000 tonnes per year, notwithstanding the impact of the accident in 2010 that seriously damaged the main production shaft. Recent activity shows that the South Australia government has essentially abandoned the Three Mine Policy, a shift with uncertain impacts, but it seems clear to WGM that Australia's uranium production is likely to increase substantially over the next decade as many deposits have been delineated and brought beyond the feasibility study stage – they are ready for development pending only completion of whatever new permitting process emerges. These deposits include Jabiluka in the Northern Territory, Yeelirrie and Kintyre in

Western Australian and Valhalla in Queensland. Collectively, the known resources in Australia total some 2 Mt of U_3O_8 ranking it first among uranium resource countries. Australia has the potential to produce more than 20% of world mine production, and its federal government believes that the stated resource base substantially understates its uranium potential. As the country has no domestic nuclear energy industry, all of this uranium will be for export, and China has been identified as major new market for Australian uranium.

The effect of a positive spot market price on uranium production is seen in Figure 21. It seems clear that the recent market situations will likely produce a similar result, baring mishaps of a nature similar to accidents that have curtailed production at Cigar Lake and Olympic Dam. Changes in mine output tend to lag behind those of prices, but production clearly responds eventually. As mentioned, the 2007 price of $120 per pound of uranium oxide still remains below the inflation-adjusted highs realized during 1976 through 1979.

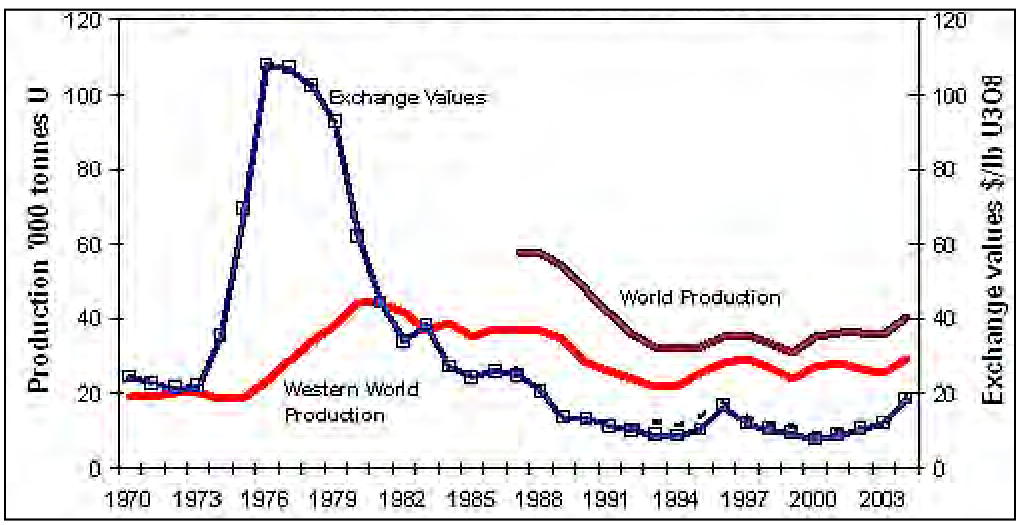


Figure 21 Uranium Prices and Mine Production (1970-2004)

Perhaps nowhere has the change in uranium production been more dramatic than in the United States as shown in Figure 22. The collapse in US mine output in response to falling prices was dramatic, largely due to the lower grade of US uranium resources - less than 1,000 tonnes of uranium was produced in 1992. The mills that these mines supplied were also forced to shut down by a combination of feed shortages and cost pressures. During 2004, six mines were operating in the US compared with 430 in 1979. All production was from in-situ leach plants – no conventional uranium mills were operating. The US industry was unable to compete with lower cost sources elsewhere. During 1976, US companies owned 92% of domestic uranium production. US expenditures on exploration crashed during the period 1980 to 1981, falling from $267M to $145M. By 1985, expenditures were $20.1M and only $3.7M was expended on uranium exploration in 1994. Between 1985 and 1994, the amount of uranium exploration drilling declined from 2,877 holes to 519 holes. US companies were simply not investing in uranium exploration as evidenced by an increase in foreign participation which had grown to 51% ownership by 1994, and at present the industry is overwhelmingly owned by foreign companies, principally Canadian.

Most recently, international uranium production has fallen due to the exhaustion of many deposits that were important producers during the late 1970s and 1980s, and a general lack of exploration to replace such mines. In Canada, high-grade deposits at Rabbit Lake, Key Lake, Cluff and many of the Collins Bay deposits were mined out. Production in the

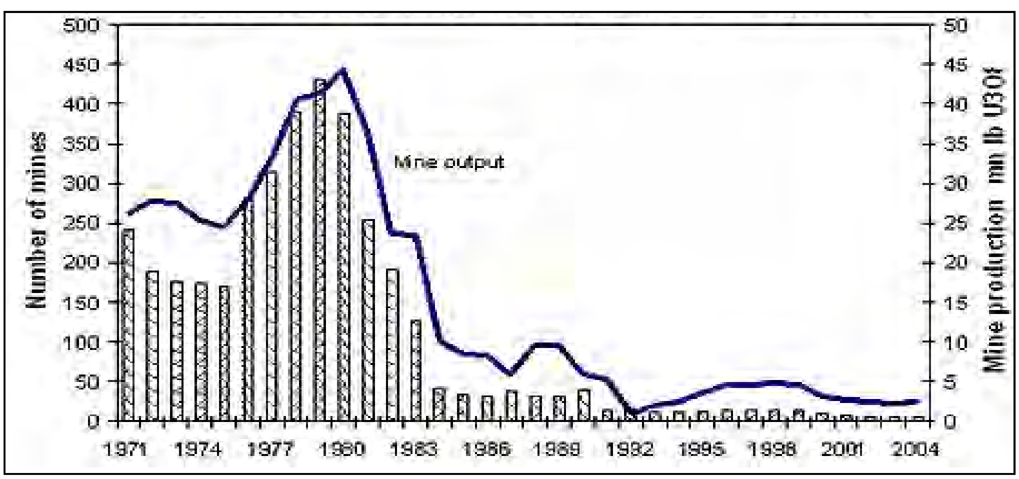


Figure 22 United States Uranium Mine Output and Operating Mines (1971-2004) – *from the US AEC.*

Beaverlodge and in the Blind River areas also ceased, although certain historical uranium resources remain in both camps. Despite these closures, Canada's net output actually increased due to the mining of higher grading deposits. In South Africa, uranium is recovered as a by-product of gold mining, and with the weak gold prices of the late 1990s and the early part of this decade, gold mine closures removed uranium supply from the market, accounting for about 26% of the total decline. Uranium mining in Gabon ceased, and in general French uranium production has not been significant for the last 10-15 years. After the collapse of the Soviet Union, many of the underground operations in the former Eastern European socialist republics closed due to high costs as well as concerns about safety and environmental impacts. Most of these mines are unlikely to reopen due to low grade and environmental concerns. During 1993, Western uranium production was down to roughly half its 1980 peak level. The price rises of 1996-97 had a discernible impact on mine output, but it was almost as temporary as the rise in prices. Western mine production rose by 32% between 1993 and 1997, and then declined by 18% during the next two years. At the same time, Russian production has tended to show a general upward trend as it converted HEU from its military stockpile to reactor grade uranium.

Renewed interest in nuclear power, partially due to energy market growth and partially due to concerns over the greenhouse gas emissions of alternative methods of generating base electrical load, has resulted in an escalation of uranium prices and consequently an increase in exploration spending. A range of undeveloped or moth-balled deposits are present in the US, the largest being the Mount Taylor deposit in the Ambrosia Lake district of New Mexico. Developed by Gulf Minerals Resources Co. in the late 1970s, the deposit has never seen full production. As with other metals, exploration expenditures will lag increased commodity prices, but will thereafter tend to track price trends quite closely. Since the mid-1980s, uranium exploration expenditures have been at a virtual standstill except in the Athabasca Basin where a collection of established producers and junior companies have persisted due to the high grade character of the unconformity-type deposits (high reward/risk ratio). Improved exploration techniques and equipment will assist the industry in finding ever more deeply concealed deposits. Explorers are also active in countries which were not open to western companies during the 1970s uranium boom, countries such as Kazakhstan, Mongolia, China and Russia. As mentioned, Australia will be a major focus because of its known potential and the change in uranium politics.

The demand for uranium is also likely to be affected by more widespread use of nuclear-generated energy if small-scale reactors are installed to service remote communities and/or industrial sites. Mitsubishi has been working in co-operation with Japan's Central Research Institute of Electric Power Industry (CRIEPI) and funded by the Japan Atomic Energy Research Institute (JAERI) to develop a 5 MWt, 200 kWe Rapid-L reactor which uses lithium-6 (a liquid neutron poison) as control medium. As conceived, the reactor would be pre-built in a factory and installed on site in a secure underground facility. According to the World Nuclear Organization website, the fuel would be highly enriched (40-50% uranium nitride) and contain 2,700 fuel pins with a 2600°C melting point. The fuel would be packaged into a disposable cartridge or "integrated fuel assembly". The whole plant would be about 6.5 m high and 2 m in diameter, and its operation would require no skill due to the inherent safety design features. The reactivity control system is passive, using lithium expansion modules (LEM), which as the reactor temperature rises, would expands into the core to quench the reaction. Refueling would take place every 10 years.

Toshiba and CRIEPI are developing the "Super-Safe, Small and Simple" ("**4S nuclear battery**") system in collaboration with STAR work in the USA. The system uses sodium as the coolant and it also has passive safety features. It is capable of three decades of continuous operation without refueling. The fuel consists of uranium-zirconium or U-Pu-Zr alloy in 169 1-centimetre diameter pins that are enriched to less than 20% U^{235}, still relatively highly enriched compared to conventional fuel for light water reactors. Both 10 MWe and 50 MWe versions of 4S are designed to automatically maintain an outlet coolant temperature of 510°C - suitable for power generation with high temperature electrolytic hydrogen production. Plant cost is projected at US $2,500/kW, and power costs are estimated at 5-7 cents/kWh for the small unit, a cost that is very competitive with diesel in many locations including Alaska where the design has gained considerable support.

19.3 URANIUM PRODUCTION OUTLOOK

A collateral effect of the low uranium prices sustained during the latter 1980s and through the 1990s is the lack of investment in new refining and fuel fabrication infrastructure. The plans announced by major nuclear countries to greatly expand the number of reactors in service will place demands on the fuel fabrication industry that will be challenging. Thus, simply producing more uranium is not sufficient to meet growing reactor demands. Mine production must be matched by a capacity to manufacture more reactor fuel. A great deal of information concerning new infrastructure development is available on the World Information Service on Energy ("**WISE**") website found at (http://www.wise-uranium.org/index.html). WISE is an information and networking centre for citizens and environmental organizations concerned about nuclear energy, radioactive waste, radiation, and related issues. Despite (or perhaps because of) its anti-nuclear stance, WISE can be a good source of new industry development information.

Cameco Corp., the world's largest uranium producer, has announced plans to invest C $6 million to increase the production capacity of its Blind River uranium refinery. Refined uranium trioxide (UO_3) will be sent to the BNFL Springfields plant in the United Kingdom for conversion to uranium hexafluoride (Cameco press release, 16 March, 2005). This project involves a proposed 33% increase to the annual licensed production capacity of the Blind River Refinery from 18,000 tonnes to 24,000 tonnes uranium as UO_3. In a move seen to increase its vertical integration in the industry, Cameco announced in early 2006 its acquisition of a 100% interest in Zircatec Precision Industries Inc., a Port Hope, Ontario based manufacturer of nuclear fuel bundles for sale to companies that generate electricity from CANDU reactors. Zircatec is planning to produce a new fuel product containing slightly enriched uranium dioxide (SEU) and blended dysprosium and natural uranium oxides (BDU). The required feed materials (SEU and BDU powders) will be exported to foreign markets.

The US is largely playing catch-up on the construction of new infrastructure. During 2006, the US moved to approve construction and operation of a new gas centrifuge uranium enrichment plant in Lea County, New Mexico to be operated by Louisiana Energy Services. Operations were planned to begin in 2008, with full capacity in 2013. However, the first centrifuge was not installed until September 2009 pointing to the long lead time for permitting nuclear infrastructure. The plans for construction of new infrastructure at the American Centrifuge plant in Piketon, Ohio planned during 2005-06, also ran into delays due to cost over-runs and uncertainties over loan guarantees. The estimated cost increased from $1.7 billion to $2.3 billion and the commercial viability of the project is now in doubt. The estimated completion date for the facility, currently in redesign, has been pushed back to 2012. A planned National Fuel Service plant based in Tennessee for down-blending of HEU to slightly enriched uranium as reactor fuel for the Tennessee Valley Authority was delayed for several years due to challenges by environmental groups. During 2006, the US Nuclear Regulatory Commission received an application from Shaw AREVA MOX Services requesting a license for possession and use of by-product and special nuclear materials for the Mixed Oxide Fuel Fabrication Facility to be built on the Savannah River Site in Aiken, South Carolina.

As can be seen, the construction of new nuclear industry infrastructure seldom meets planned timetables. Plans were made in the year 2000 by the Brazilian Government to construct a new 100,000 SWU/year gas centrifuge enrichment facility near Rio del Janeiro. The US$130 million Resende plant would supply about half the enrichment services needed to provide fuel for the country's Angra-1 and -2 reactors with enrichment activities beginning in 2003. During construction, the Brazilian government refused to allow IAEA inspectors to examine the facility on the grounds that the Government was protecting proprietary technology. Agreement was finally reached in November, 2004. On 5 May, 2006, the Minister of Science and Technology inaugurated the first unit of the Resende plant. The completion of the plant is not now expected until 2010, at total investment costs of US$267 million.

In November, 2005 regulatory approval was being sought from the UK Government by URENCO to enrich recycled uranium at Capenhurst as the company already does at its Almelo Plant in the Netherlands. The potential increase in nuclear power around the world was seen to provide a need for enriched recycled uranium fuel. The application covers the potential to enrich to higher levels than currently licensed in anticipation of new requirements in the civil nuclear power industry as new generations of reactors are developed. In the meantime, British Nuclear Fuels plc ceased uranium hexafluoride (UF6) conversion operations at its Springfield facility during March, 2006, and sold its uncommitted UF6 conversion capacity to Cameco Corp.

URENCO, an independent, global energy and technology group with production from plants in Germany, the Netherlands and the United Kingdom, was interested in building an enrichment plant in Australia. URENCO believed that Australia represented a good base for servicing the growing Asia-Pacific market for nuclear power fuel. The company was interested in assessing the economics of building an enrichment plant using its own centrifuge technology in Australia if it were invited to do so. Contrarily, Areva, the French national nuclear power company, ruled out any interest in investing in uranium enrichment in Australia, as it believed that such facilities were not commercially sound unless Australia was prepared to accept nuclear energy.
Australia's decades-long opposition to domestic uranium fuel manufacturing has been underscored by Silex Systems Ltd.'s decision to license its laser-based uranium enrichment technology to General Electric in the US for fuel fabrication. The agreement

includes a provision for the potential construction of a test loop, pilot plant and a full-scale, commercial enrichment facility built at GE's nuclear energy headquarters in Wilmington, North Carolina or another suitable location in the United States, however not in Australia where the technology was developed. Although at this moment, nuclear energy in Australia is being viewed more favourably, the nuclear industry competes with a significant coal lobby seeking to maintain its position as the country's energy choice.

Japan announced in late 2000 a project to construct a mixed uranium and plutonium oxide ("**MOX**") fabrication plant adjacent to Japan Nuclear Fuel Ltd.'s ("**JNFL**") Rokkasho-mura reprocessing plant then under construction. Planned to produce 130 tonnes of MOX fuel per year, the plant will cost approximately US$1.1 billion. The agreement to build the Rokkasho plant was finally approved during April, 2005, nearly 4½ years later. In November, 2006 JNFL announced its existing Rokkasho reprocessing plant had produced its first uranium-plutonium mixed oxides, the first step in producing MOX fuel. The plant expansion plan was slowed by civil actions, but construction began in October, 2010 and the facility entered an initial testing phase during 2012. Its planned use of laser uranium enrichment technology, under development since 2001 (or earlier), was shelved in preference to an improved centrifuge method. The delays have resulted in the large accumulation of plutonium at Rokkasho adding even more to Japan's already huge plutonium stockpiles, mostly in MOX (9 tons in Japan and 38 tons in Europe which it is obliged to take back – *internet sources*).

In 2006, Russia planned to build a uranium enrichment centre on the premises of the Angarsk Electrolysis Chemical Combine in Irkutsk. The centre was expected to be in operation in 2007, however in late 2008 it still faced strong opposition from Russian and Japanese NGO's and it is uncertain to WGM whether construction had started. Kazakhstan has made a decision to join Russia's initiative to set up an international nuclear-cycle centre under the control of the International Atomic Energy Agency (IAEA) on Russian territory. Japan is especially interested in this as a means of reducing its accumulated plutonium stockpile.

China is forging ahead with new fuel fabrication infrastructure and has announced its plan to use the equipment from the never operated Siemens Hanau MOX fuel production plant for a planned 500,000 SWU MOX fuel plant at Lanzhou[25]. The Government of Germany, which licenses the technology, has made no decision yet on an export license for the equipment. The MOX fuel is to be used in fast breeder reactors. A 65 MW fast breeder research reactor is currently under construction in Fangshan County near Beijing. This sodium-cooled reactor is expected to begin delivering power in 2010 (China, 2009). The plutonium required for the MOX fuel is to be recovered from the spent fuel of China's eight conventional reactors, though a commercial reprocessing plant does not yet exist. Of international concern is the fact that the excess plutonium to be bred such a reactor would be highly weapons grade. Russia has sold two fast breeder BN-800 (880 MWe) reactors to China with construction to begin in 2011 and commissioning in 2018-2019. Both China and Japan are participating in the design and testing of a new BN-1200 reactor. These fast breeder reactor designs are significant as they have the capacity to produce nearly as much fuel as they consume.

Iran also is continuing, despite wide criticism, with its nuclear fuel fabrication program which employs its own centrifuge technology for uranium enrichment. Shortly before writing the initial draft of this report, WGM Vice-President Al Workman had recently returned from Tehran where the media contained discussions of gasoline rationing, a looming crisis created by Iran's young and growing urban population, as well as Iran's aging oil infrastructure which is incapable of supplying its gasoline needs. Nuclear energy is seen by many as a means of allowing Iran to export a greater percentage of its oil and gas, some of which is currently burned to generate electricity. Controversial as it is, Iran's avowed non-military nuclear program is pragmatically seen my many as a necessity, even as much as the confrontational political stances are seen as not.

19.4 REE FUNDAMENTALS

The major uses of the rare metals are summarized in Table 32. The recent FOB market price (oxide form) as of March, 2011 is indicated in US Dollars (*source* www.metalmarkets.com except for Ho, Er, Tm and Yb provided by Baotou Research at www.baotou-rareearth.com). These prices reflect an increase of approximately 50% over a 12-month period.

[25] This annual capacity is sufficient to fuel 5 typical 1,000 MW light water-cooled reactors, each of which could power a city of about 600,000 population.

Table 32

Major Industrial Applications of Rare Earth Metals and Compounds

Element	Symbol	Market Price	Applications
Lanthanum	$_{57}La^{139}$	$93.00/kg	Catalyst used in the cracking of hydrocarbons to produce fuel, fuel calls and batteries, in optical glass to modify the refractive index, NiMH batteries for computers, in phosphors for X-Ray films. Used to reduce radiation dosages in MRI, CAT and sonogram imaging techniques.
Cerium	$_{58}Ce^{140}$	$96.00/kg	Catalytic converters, additive for diesel fuels. Polishing compound for high performance glasses (television screens, mirrors, optical glass, disk drives and silicon microprocessors). Decolouring agent for glass and photographic filters. In high-strength, low alloy steels, used to improve performance in chrome plating baths. Used with Tb in phosphors in tri-colour lamps and compact fluorescent lighting. Used with Zr in high-performance insulating ceramics (Space Shuttle).
Praseodymium	$_{59}Pr^{141}$	$138.50/kg	Colouring pigment in ceramic tile/glass. High-quality mirrors. Used with Nd in photographic filters to reduce certain wavelengths of light. Pollution-control catalysts. Used to make electric motors lighter.
Neodymium	$_{60}Nd^{144}$	$150.00/kg	Nd-Fe-B magnets for mobile phones, portable CD players and computers. Nd capacitors in mobile phones. Nd-lasers for surgery and in manufacturing sector. Strong magnets for MRI units. Anti-glare automobile glass and mirrors, CRT glass. Sky-blue colouring pigments in ceramics and glass.
Promethium	$_{61}Pm^{145}$	n.a.	Very scarce – no stable isotopes – longest half-life (Pr^{145}) is 17.1 years.
Samarium	$_{62}Sm^{150}$	$91.00/kg	Filter glasses for Nd-lasers. Used to stabilize the high-temperature performance of REE magnets (Sm-Co magnets are the strongest available). Used with titanates as dielectric compounds in capacitors operating at microwave frequencies. Glass and tile pigmentation.
Europium	$_{63}Eu^{152}$	$660.00/kg	A photon emitter used as the red phosphor in television and computer screens. Used in fluorescent lights to reduce electrical consumption. Used as a luminescent tag in living tissue medical research.
Gadolinium	$_{64}Gd^{157}$	$100.50/kg	Magnetic properties make it useful in magneto-optic recording technology – e.g. bubble-memory in super-computers. Enhances imaging in MRI devices. Used in the detection of radiation leaks in nuclear power-plants.
Terbium	$_{65}Tb^{159}$	$780.00/kg	Improves energy efficiency in fluorescent lamps. Used in magnetic films used for recording data in magneto-optical applications.
Dysprosium	$_{66}Dy^{163}$	$467/kg	Allows electronic devices to be smaller and faster. Added to ceramics to produce high-capacitance miniaturized capacitors. Added to NdFeB high-strength permanent magnets to improve coercivity.
Holmium	$_{67}Ho^{165}$	uncertain	Very scarce and has few practical uses
Erbium	$_{68}Er^{167}$	uncertain	Used in amplifiers for optic data transmission. Medical and dental lasers. Only stable pink pigmentation for glass (sunglasses and decorative glass).
Thulium	$_{69}Tm^{169}$	uncertain	Rarest of the REEs – similar chemistry to yttrium – can be used in sensitive X-Ray phosphors to reduce the required radiation exposures.
Ytterbium	$_{70}Yb^{173}$	uncertain	Similar chemistry to Y – when under high stress, increases its electrical resistance by 10x – and therefore used in stress gauges to monitor seismic ground movements.
Lutetium	$_{71}Lu^{175}$	n.a.	One of the least abundant REEs – Ce-doped lutetium oxyorthosilicate (LSO) is used in detectors in positron emission tomography (PET) applications.
Yttrium	$_{39}Y^{89}$	$105.50/kg	Used in oxygen sensors for engines to improve the combustion of fuels. Y-Fe garnets used as resonators in frequency meters, magnetic field measuring devices, tuneable transistors and Gunn oscillators, laser crystals. Stabilizer and mould-former for light-weight engine turbine. Stabilizer in rocket nose cones. In ceramics used for melting radioactive metals. Used as nozzles for jet casting molten alloys. Used as a primer for other metallic coatings (e.g. titanium coatings).

The REEs are also used in the defence industry in many applications including precision-guided munitions (smart bombs), rangefinder lasers and target designators, detection devices for underwater mines, communications, aircraft control mechanisms, high-temperature ceramics in jet engines, information displays, radar systems, coatings, optical equipment, sonar applications and in electronic counter measure technologies.

During the early part of the decade, mineral economists and metals market forecasters predicted growth in REE demand that in reality has fallen short of expectations. WGM believes this is largely due to the impact of the global financial crisis that initially affected the markets during late 2008 (and continues today). As a result, metal demand declined in the west while Chinese growth continued more or less unaffected due to its population and growing economy. India also contributed to increased demand. The market has certainly grown, but clearly not as expected a few short years ago.

On the supply side, the growth in demand has not been balanced by increased supply. WGM believes that this is mostly due to the time required to make discoveries, establish a resource base, design a new mining operation and secure the necessary operating permits to allow the mine to be constructed. More recently, economic uncertainty has somewhat impeded the ability of companies to raise capital for projects.

As a result of the foregoing impacts, REE demand has slowly out-stripped supply and created an imbalance. China, with approximately 95% of global REE production as a result of its aggressive actions against competitors, is now faced with the possibility that it may not be able to satisfy its own fabrication demands. Even less is it ability to meet the foreign demand that it created by driving competitors out of production. During 2010, China reacted by reducing rare metals exports to Japan, a major manufacturer of products containing REEs, and REE prices reacted accordingly. China will remain confronted with the problem of balancing competing interests for the foreseeable future.

The need for increased REE production has not gone un-noticed by the international mining community. Typically, the junior mining sector was quick to respond to forecasts made a decade ago regarding the current situation. Old projects and more recent discoveries have been revived, and fresh venture financing has been found to support renewed exploration projects. Unfortunately, the financial crisis has negatively impacted several major REE projects that sought financing during the crisis. Even now, investment has been slow in coming to the effect that both the Mount Weld and Nolan's Bore REE mine developments are behind the schedule originally envisioned by the owners. This situation appears to have cleared during mid-2010 for both projects. Lynas Corporation is currently mining and processing Mount Weld ore to create a REE-rich concentrate that is being stockpiled until the company's processing facility in Malaysia is constructed. Arafura Resources has carried out bulk sampling, test concentrate production and pre-leach testing at its Nolan's Bore project. Both projects have caught the interest of foreign REE purchasers, mainly in Japan, and Lynas has substantial off-take agreements already in place for the commencement of REE production in Malaysia.

The junior mining sector is poised to bring a handful, perhaps a dozen or so, REE projects into production during the next decade. A great amount of hyperbole has surrounded many of these projects to the affect that the economic realities are often obscured. Clearly, some due diligence is needed by any investor or company interested in this minerals sector.

China's minerals infrastructure that supports the production of rare earth metals is thought to be the world's strongest. Previously, China's position was in the top three, with the other two comprising the United States and Japan. However, in the last decade, China's output has soared, with the major effect of lowering prices and driving its competitors out of the market. In 2007, China was responsible for 96.8% of global rare earth metal production, most of which is from mines located in Inner Mongolia. The Inner Mongolian Baotou Steel Union Co., Ltd. is the largest rare-earth metal manufacturer in China. Even though about 42% of global REE resources and reserves are situated outside of China, its cheap labour and Government subsidies ensured that Chinese companies were well supported in respect to investing in new mines and processing plants during the 1980s. This infrastructure included rare earth metals research and development laboratories that worked to undercut China's rivals. In the early part of the 1990s, China could produce neodymium very inexpensively for the market, resulting in a price drop from $11.70 per kilogram in 1992 to $7.40 in 1996. In a relatively short time, the REE market volume increased from 40,000 tonnes per annum (tpa) to 125,000 tpa. For nearly 20 years, China has pursued a policy to make it the "*OPEC of rare earth metals*".

Since 2008, China has restricted its REE exports to ensure that its domestic needs can be satisfied. It was predicted that sometime in 2011 or 2012, Chinese domestic demand is expected to surpass Chinese domestic production, a view that WGM found surprising given the country's vast resources. However, WGM has observed that many Chinese companies are engaged in a global search for mineral deposits. Both state-sponsored

Chinese enterprises as well as nominally private companies are seeking foreign REE supplies. China Non-Ferrous Metals Mining Co., Ltd. (CNMC) has offered to take a controlling interest in Australia's Lynas Corporation Ltd., owner of the Mount Weld deposit which potentially has the capacity to account for as much as 25% of world production. The Jiangsu Eastern China Non-Ferrous Metals Investment Holding Co. Ltd., a unit of East China Exploration & Development Bureau, agreed to acquire a 25% stake in Australia's Arafura Resources Ltd., a gold and mineral mining company which has a rare earth and phosphate deposit at Nolan's Bore. A Chinese private investment company, Creat Group, acquired about 20% of emerging Australian mining and chemical company Galaxy Resources Ltd., and China has twice tried to a acquire a controlling interest in the US company Molycorp Minerals which owns the now dormant but re-emerging Mountain Pass Mine, arguably the world's richest neodymium mine outside China. The takeovers have failed on both occasions, and since July, 2010 Molycorp shares have been publicly traded. China National Nonferrous Metals, San Huan and Sextant MQI Equity Holdings succeeded in acquiring Magnequench in 1995, a department of General Motors created for the commercialization of a neodymium magnet. In 1997 a merger between Magnequench and the Canadian company AMR founded a new company named Neo Material Technologies, a REE producer that is also active in rare metal recycling with operations in China and production centres in China and Thailand.

According to the Peterson Institute for International Economics (www.piie.com), China's rare metal industry could be characterized by what industry observers call "disorderly competition" and "price chaos". Local firms have engaged in a price war leveraged on expanded production. In 2008, China's annual smelting capacity for REE metal production exceeded 200,000 (short) tons, which at the time was more than double global demand. In August, 2009, the Ministry of Industry and Information Technology issued a draft policy recommending an annual export quota of 35,000 tons, improvement in mining and environmental practices and a potential ban on exporting five REEs seen to be in short supply and essential to China. The goal seems to have been to consolidate the domestic industry and stabilize prices while trying to attract investment in downstream applications and fabrication.

This "disorderly" competition from Chinese producers was the principle reason for the closing of the Mountain Pass Mine in California at which time overproduction killed the market and drove out higher cost producers. A very different market exists at this time, especially since 2007, with China reducing its REE exports and potentially restricting the export of some metals entirely. China has apparently pursued this policy for two reasons; firstly to assure itself of a supply of metals vital to its defence industries and manufacturing sectors, and secondly to pressure western manufacturers to establish production facilities in China. The 22 September 2010 embargo of REE exports to Japan in retaliation for Japan seizing a Chinese trawler has caused ripple effects through the industry since Japan was totally reliant on Chinese sources for metals used in the production of REE magnets. Japan's position as a major supplier of magnets to the West has provoked the US Government to consider a bill to subsidize the revival of its domestic REE industry. Due to the increased demand for REE metals, Molycorp Inc. is planning to invest $500M in the reopening of the Mountain Pass Mine by the second half of 2011.

The United States imports about 87% of its lanthanide metals from China. While potentially having the second largest rare-earth reserves, the US ceased production activities at its largest REE mine, Mountain Pass, ostensibly for reasons relating to resource conservation, but more accurately due to higher costs than competing producers in China. As a result, the US imports substantial quantities of rare earth products (mostly metals and oxides) from China. Some of this is reportedly being stockpiled.

Molycorp is processing stockpiled ore at the Mountain Pass mine site and currently produces 3,000 tons of rare earth products per year. As such, the company is the only REO miner in North America or Europe. Molycorp is slowly moving the mine back into production. Following the execution of the Company's "mine-to-magnets" strategy and completion of its modernization and expansion efforts at its Mountain Pass processing facility, it expects to be one of the world's most integrated producers of rare earth products, including oxides, metals, alloys and magnets.

On 18 October, 2010, Molycorp announced that it has engaged BNP Paribas Securities Corp. to arrange a debt facility of up to $150 million to be used primarily to finance part of the company's Mountain Pass Mine modernization which will see its output increase to 20,000 tons of rare earth products per year by the end of 2012. The debt facility, if implemented, would supplement the approximately $379 million in net proceeds from Molycorp's initial public offering completed in July, 2010.

Several other REE mines could be developed in the US, however, none are closer to full mine production than Mountain Pass. The Bokan Mine is Alaska could be brought back into production, however it is likely that delays relating to resource definition and permitting would stall production in the short term. No other deposit is as advanced.

In respect to non-US production, Australia's Arafura and Lynas Corp. will be able to produce some 30,000 tonnes or more of rare earth metals by the middle of this decade (2015-2016). Various forecasters have predicted that this production will not be sufficient to meet surging world demand. Certainly Lynas has moved to lock much of its production into off-take agreements, and so may have little spare capacity to satisfy additional requirements.

Several potential producers are advancing projects towards mining. One is Avalon Rare Metals Inc.'s, a Canadian company with its 100%-owned Nechalacho Project at Thor Lake in the Northwest Territories. This deposit, known for more than 20 years, is emerging as a major undeveloped REE resource. The Company has advanced the project with the view that it is enriched in HREEs, however in order of declining abundance the major metals are Ce, Nd, La, Y, Pr and Sa….. Yttrium is the only HREE metal that is present in concentrations above 0.1%. Nevertheless, the deposit is sizeable at 197 Mt averaging 1.24% $LREE_{TOTAL}$ and 0.22% $HREE_{TOTAL}$. The Company is well funded, has no debt and its work programs are essentially unaffected by market volatility. Its plan, assessed through a recent scoping study by SNC-Lavalin, is to construct a separation plant with an intended production capacity of 25,000 tonnes per annum. This plant capacity is intended to handle the presently contemplated production of 10,000 t/a from Nechalacho, any future Avalon production increases, and process material from other potential future producers, especially those producing chemical precipitates rich in the heavy rare earths.

An effort similar to that of Molycorp sees Rareco moving the past-producing Steenkampskraal Mine back towards production in South Africa with a target date a few years in the future. Australia is certainly on the cusp of ramping up production even while the Mount Weld Mine is stockpiling ore on site and Lynas is completing the construction of its 30,000 t REE/year concentrator, having completed the task of securing markets for its REE output. At the same time Arafura Resources is working towards 10,000 t REE/year production from Nolan's Bore deposit. With this backdrop, it is difficult to see any production from new Canadian mines in the near future.

Japan, a major fabricator of REE-bearing goods, imports more than 10,000 tons of rare earth metals per year, while about a fifth of the country's total annual consumption is believed to enter the country through a thriving black import network, without which Japan would already be in a severe supply crisis. China has been lowering its export quotas for rare earth metals by about 6% annually since the start of the decade, with Japan allotted only 38,000 tonnes in 2009. Toyota and Honda alone will consume about that quantity and experts in Australia have predicted a wider global supply crunch within three years as demand surges beyond existing refinery and extraction capacity. In view of the importance of rare earth metals to its economy, the Japanese Government has initiated a search for alternative supply sources in Vietnam, Kazakhstan and elsewhere. However, Japan is being forced to compete against very aggressive moves by Chinese companies which are attempting to negotiate deals to finance prospective miners that are experiencing financing difficulties in Australia (Lynas), and in the US (Molycorp). The Japanese government supports a less aggressive policy and a more supportive role that is less take-over oriented. Japan's official development assistance (ODA) strategy calls for increased support for mining development in foreign countries, infrastructure development in the surrounding areas, active cooperation for technology transfer and protection of the environmental.

The nature of the potential crisis over shortages in rare earth metals is more acutely voiced in Japan which is a major producer of the REE magnets used in everything from high-performance electric motors to jewellery. In a recent article "The Coming Rare Earth Metals Crunch" the writers have pointed out that the world demand for rare earth metals used in cell phones, hybrid cars, wind turbines and many electronic applications is currently over 110,000 short tons per year, and projected by the US Geological Survey to grow some 71% to 188,000 tons by 2012. If true, global demand could exceed supply by 40,000 tons year in the near future. The situation with key rare earth metals is particularly acute: (1) neodymium, the key component of an alloy used to make the high-power, lightweight magnets for electric motors of hybrid cars as well as in generators for wind turbines; (2) terbium and dysprosium are added in smaller amounts to the alloy to preserve neodymium's magnetic properties at high temperatures; (3) terbium, the key ingredient in low-wattage light bulbs that use 40% less electricity per unit of output; (4) cerium and lanthanum, used in catalytic converters for diesel engines; and, (5) europium, used in lasers. The consumption of rare earth metals is expected to grow as current usages grown and new uses are found. Each Toyota electric Prius motor requires 1 kilogram (2.2 lb) of neodymium, and each battery uses 10 to 15 kg (22-33 lb) of lanthanum. That number will nearly double under Toyota's current plans to boost the car's fuel economy.

Japanese companies that are actively seeking REE projects worldwide include the following:

Sumitomo Corp.	plans to produce rare-earth metals in Kazakhstan through a joint venture established with state-owned nuclear power company Kazatomprom by the end of this year. Using Kazatomprom's facilities, rare earths will be removed from uranium ore left over after uranium has been extracted. Annual output is expected to reach 3,000 metric tons in 2010, which is slightly less than 10% of Japan's current total imports.
Toyota Tsusho Corp.	plans to spend a total of 40 billion yen on natural resources development, mainly for rare earths, over the next five years. It intends to start extracting the metals from tin ore in Indonesia, and it is also considering developing mines in such countries as Mongolia. By expanding its rare-earth business, the firm hopes to secure stable supplies for Japanese carmakers like Toyota Motor Corp.
Marubeni Corp.	will start recycling rare earths through a subsidiary. It hopes to develop efficient recycling technologies in preparation for four or five years down the road, when more hybrid cars will be scrapped
Mitsubishi Corp.	has entered a partnership with Neo Material Technologies of Canada to recover by-products such as dysprosium and terbium from the Pitinga tin mine in Brazil. The two companies may form a joint venture and will acquire rights to purchase at least 20% of the mine's output.
Mitsui & Co.	plans to import a large volume of the rare metal from Canada. The move comes on the heels of the firm's investments in nickel and cobalt - other rare metals essential for manufacturing lithium-ion batteries. Mitsui has obtained exclusive sales rights to lithium produced at a mine that Canada Lithium Corp. owns in the Canadian province of Quebec. After shipping samples to potential customers, Mitsui plans to start importing around 2,000 metric tons of lithium a year from the mine in 2013 for sale to Japanese and South Korean manufacturers of lithium-ion batteries.

19.5 ENVIRONMENTAL

Uranium mineralization in the Elliot Lake area is relatively low grade and contained in highly indurated, conglomeratic host rocks. At an average grade of 2 lbs of U_3O_8 per ton of ore, the production of one ton of uranium oxide produced 1,000 tons of mine tailings. The 11 mill-sites in the Elliot Lake area, with an average area of 230 acres, are estimated to contain a total of over 149.3 million tons of tailings (MNDM), which contain low concentrations of naturally occurring radioactive elements, including traces of uranium, thorium, radium and other heavy metals, especially iron derived from pyrite and pyrrhotite. Radium decay emits the radioactive gas radon (Rn_{226}) and other daughter products, such as bismuth (Bi_{222}) and polonium (Po_{210}), which are potential health hazards.

Given the foregoing contents, it is clear that any future reclamation of tailings must be geared towards:

- reducing direct gamma radiation from the impoundment area to essentially background levels,
- reducing the radon emanation from the impoundment area to the surrounding environment; and,
- stabilizing the pile to prevent it from contaminating the groundwater through erosion, seepage, or water runoff.

Finally, the tailings remedial action must eliminate or minimize the need for additional work during on-going monitoring and maintenance program following reclamation. The two major concerns for tailings remediation involve covering the pile and stabilizing the embankment as the costs incurred by failure of the tailings cover or destabilization of the embankment can be substantial. Groundwater problems resulting from the exit of contaminated water from an inadequately protected tailings pile are difficult to predict, and can be very costly to bring under control. The presence of iron sulphides in the Elliot Lake tailings raises the concern of acid generation as a result of oxidative processes. The tailings contain approximately 5% pyrite and minor pyrrhotite. The oxidation of sulphides lowers the pH of the tailings and results in enhanced leaching of radioactive metals and other trace heavy metals. Potential re-dissolution of radionuclides held as insoluble barium sulphate sludge, a precipitate removed during the control of radium with barium chloride, may also result from exposure to acid water. Site remediation at Elliot Lake therefore uses a water cover option to prevent acid generation by excluding oxygen from the tailings while at the same time providing a barrier to radon evolution. This approach requires that the tailings pile be uniformly levelled to eliminate the need for internal dikes, thus also reducing the risk of water release from internal dike failure. This approach has proven to be very successful in the Elliot Lake Area.

The restoration costs for decommissioned uranium mines in Canada are given in Table 33. These costs, particularly those associated with Blind River deposits (bolded) should serve as a guide to Appia in planning its approach to conventional mine development in the Elliot Lake area. However, the possibility of using existing mine workings as a repository for tailings should be investigated. The use of in-situ leaching for extracting uranium from mine pillars would altogether avoid tailings production.

Table 33
Restoration Costs of Shutdown of Uranium Production Facilities
in Canada in 1993 Dollars

Mine Name	Production (tonnes U)	Production Cost (M US $)	Tailings (tonnes)	Unit Costs (US $/t tailings)
Beaverlodge	17,500	10.55	5,800,000	0.75
Agnew Lake	**750**	**2.14**	**37,500**	**n.a.**
Madawaska	3,670	n.a.	4,460,000	0.04
Quirke	**43,700**	**29.87**	**46,000,000**	**0.35**
Panel	**9,200**	**16.23**	**15,000,000**	**0.65**
Stanrock	**10,400**	**10.39**	**5,700,000**	**1.71**
Denison	**56,100**	**15.58**	**63,300,000**	**0.65**
Rabbit Lake	58,900	18.51	14,100,000	0.46
Key Lake	74,400	20.39	4,700,000	0.92

Source: IAEA, 2002 – Elliot Lake operations are in bolded text.

In a meeting with the manager of the Ontario Ministry of the Environment (“**MOE**”) office in Sault Ste. Marie on 15 May, 2007, it was reported to WGM that all of the former uranium mines in the Elliot Lake area have been decommissioned and all mining and supporting infrastructure have been removed from the sites. The access roads to all sites are gated to prevent vehicular access. The MOE also reported to WGM the following:

- the Elliot Lake mine sites are under the administrative jurisdiction of the Canadian Nuclear Safety Commission (‘**NSC**”), a federal body established for the regulation and monitoring of all infrastructure in Canada related to the nuclear industry;
- the environmental monitoring of the decommissioned sites falls within the mandate of the Joint Review Commission (“**JRC**”) which is composed of representatives from the Ministry of Northern Development and Mines, the

Ministry of Natural Resources, the MOE and two federal bodies – Environment Canada and the Department of Fisheries and Oceans;

- the NSC is the main driver in setting objectives for the JRC;
- the MOE is aware that uranium exploration has been renewed in the Elliot Lake area and that considerable expenditures are being made in the search for new uranium deposits;
- there are no land withdrawals in the Appia project area that would negatively impact Appia's exploration plans;
- subject to explorers meeting statutory requirements, completing the permitting process and gaining the required approvals, there are no current regulations or policies that would preclude a return to production of any of the decommissioned mines, or the mining of new deposits.

20. INTERPRETATION AND CONCLUSIONS

20.1 GEOLOGY

The Elliot Lake uranium-REE deposits are paleoplacers within which the economic minerals are typically deposited in conglomerates at the base of a sedimentary cycle. The host rocks are contained within the Quirke Lake Syncline, a major east-west trending fold structure located north of the town of Elliot Lake. The deposits are stratabound, commonly occurring in stacked sheet-like bodies of quartz-pebble conglomerate. Mineralization is mostly disseminated along bedding planes and the highest grades are associated with higher concentrations of pyrite and well packed quartz pebbles. The weight of evidence suggests a sedimentary origin for the mineralization. The district wide presence of brannerite (UTi_2O_6), the main economic mineral, and U-bearing phosphates such as monazite ($[Ce,La,Nd,U,Th]PO_4$), xenotime ($Y\text{-}UPO_4$) and other rare earth minerals relates quite well to the weathering of a U-Th-REE enriched (granitic) source. Pyrite and to a much lesser extent, pyrrhotite, are the main minerals associated with uranium, occurring as overgrowths on detrital pyrite grains and on uraninite grains altering to coffinite.

It is very unlikely that any new surface exploration program will add measurably to the geological understanding of the Appia claims notwithstanding the possibility that additional structure might be discovered that, in turn, might affect the uranium-bearing horizons at depth.

20.2 EXPLORATION AND MINERAL RESOURCES

No recent exploration has been completed in the Appia project area prior to 2006. The last major historical exploration programs consisted of deep drilling by Kerr McGee from sites along the axis of the Quirke Lake Syncline. The average hole length was approximately 1,500 metres (5,000 feet). The drilling succeeded in testing the uranium-bearing Matinenda Fm. at points scattered across the basin at a kilometre-scale spacing (or more). Low-grade intersections, averaging generally less than 1.5 lbs U_3O_8 per ton, were encountered – these are in keeping with the general tenor of the deeper mineralization that was mined during the later stages of Elliot Lake's mining history. Most intersections contained a few narrow higher grading sections, commonly exceeding 3-4 lbs U_3O_8 per ton.

Recently, Appia has completed an airborne magnetic and MegaTEM electromagnetic survey which has outlined the Quirke Lake Syncline (basin) and shown the presence of various structures and dikes within the basin. IP surveying was completed on the EMC Option by Quincy Energy Corp. (now Energy Metals Corp.), but this failed to provide useful targets for drilling despite the recommendations of the geophysicist who interpreted the data.

WGM was recently very successful in its first attempts during 2007 at relocating Kerr McGee drill holes. These holes were drilled vertically from the Gowganda Fm. through the base of the Matinenda Fm. The BW-sized casings examined by WGM were rusty but otherwise well preserved. WGM concluded from this that the precise location of all of the Kerr McGee holes should be established and the locations accurately measured using a GPS with a multiple-count, position averaging capability to reduce the estimated position error. Appia has since carried out this surveying and relocated all of the key drill sites where economically interesting uranium mineralization was encountered.

In 2007, WGM recommended that the Kerr McGee drill holes be used as a means of redrilling the Banana Lake Zone in the deep basin through wedging multiple holes from the main vertical hole. Wedging off-hole at a distance of 300 m above the Matinenda Formation could produce a second intersection 30-35 metres away from the initial pierce point. By using multiple wedged holes in this way, the variability of mineralization can be tested and the resource potential assessed at a significantly lower cost that redrilling from surface. Appia subsequently used this approach, successfully wedging off of two historical holes as well as two new holes of its own drilled during 2008. Appia's 2007-08 winter drilling program in the Banana Lake Zone confirmed the historical results and its follow-up during the latter half of 2008 extended the area within which NI 43-101 compliant Mineral Resources exist.

In the Teasdale Lake Zone, Appia's drilling during the winter 2007-08 exploration program confirmed historical intersections which were concentrated in an area west of Teasdale Lake, with holes ranging from less than 300 m to nearly 600 m in length. Former Rio Algom Chief Geologist Doug Sprague's historical resource estimate based on this drilling was audited by WGM and confirmed as a valid expression of the amount of uranium in the Teasdale Zone. Appia's drilling enlarged the area previously known to contain uranium resources and provided the basis for a NI 43-101 compliant Mineral Resources estimate. Using a cut-off grade of 0.60 lbs U_3O_8/ton, WGM's estimate showed that the Teasdale Deposit contained an Indicated Mineral Resource of 17.4

million tons (15.8 Mt) with an average grade of 1.10 lbs U_3O_8/ton (0.55 kg U_3O_8/t) and an Inferred Mineral Resource of 48 million tons (43.5 Mt) at the same grade (Workman and Vasak, 2008) – see appendices. The Banana Lake Inferred Resources were estimated by Kurt Breede, co-author of this report. The two estimates are summarized in Table 34.

Table 34
NI 43-101 Compliant Uranium Mineral Resources on the Appia Property
(using 0.6 lb U_3O_8/t cut-off)

Zone	Classification	Tons	S.G. (tons/m^3)	Average Grade (lb U_3O_8/ton)	Contained Uranium (lb U_3O_8)
Banana Lake	Inferred Resources	30,315,000	3.14	0.912	27,638,000
Teasdale Lake	Indicated Resources	17,400,000	3.14	1.10	19,000,000 *
	Inferred Resources	48,000,000	3.14	1.10	52,700,000 *

* All tonnage and total lbs U_3O_8 amounts rounded to nearest thousand or thousandth. Totals may not add up due to rounding

Note: The reader is further advised to review qualifying notes that are found in Table 23 on page 158.

The resources defined in the Banana Lake Zone have an average grade that is approximately 20% higher than the historical estimate of 0.76 lbs U_3O_8 per ton. The tonnage represented in the total resources in the Teasdale Lake Zone represent a 3.4 fold increase over the historical resources with only a small reduction in average grade: 1.1 lbs U_3O_8/ton from 1.21 lbs/ton – a 9% reduction. Clearly, these results are seen as positive and supportive of additional exploration. These resources potentially represent a stable long-term supply source for an energy utility.

WGM's 2008 estimate of the uranium resource in the Teasdale Lake Zone has been up-dated with a combined uranium-rare metal resource estimate. However, this latest estimate is based solely on Appia's recent exploration drilling as the historical holes lack REE data. As a result, the U-REE estimate summarized in Table 35 takes in a resource area (volume) that is considerably smaller than that used for the 2008 uranium-only resource estimate. The reduction in contained uranium in the uranium-REE resources does not imply that the additional mineralization does not exist, but rather that it cannot be included in the volume under consideration due to the lack of matching REE assays. Of particular importance from this latest estimate is the fact that the REE and U-bearing zone is much thicker (7.22 m) than the zone that can be mined if uranium alone is considered (approximately 2.44 m).

Table 35
Summary of Teasdale Zone Rare Earth Metal and Uranium Resource Estimate

Resource Category	Tonnes ('000)	Tons ('000)	Average Grade TREE (%)	Average Grade U_3O_8 (lb/ton)	Average Thickness (m)	Contained TREE ('000 lbs)	Contained Uranium ('000 lbs U_3O_8)
Indicated	3,366	3,710	0.146	0.506	9.76	10,852	1,878
Inferred	21,217	23,388	0.181	0.615	7.22	85,895	14,379

Note: The reader is advised to review qualifying notes that are found in Table 23 on page 158.

The average grades for the individual REEs comprising the TREE are as follows in Table 36.

Table 36
Individual REE Resource Grade Composition Summary

Category	Light REE (lbs/ton)						**Heavy REE (lbs/ton)**									
	La	Ce	Pr	Nd	Sm	Eu	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Y**
Indicated	0.75	1.33	0.13	0.43	0.07	0.002	**0.04**	**0.01**	**0.03**	**0.004**	**0.010**	**0.002**	**0.01**	**0.002**	**0.01**	**0.11**
Inferred	0.93	1.64	0.16	0.53	0.09	0.004	**0.06**	**0.01**	**0.03**	**0.016**	**0.012**	**0.002**	**0.01**	**0.002**	**0.01**	**0.13**

Note: The reader is advised to review qualifying notes that are found in Table 23 on page 158.

Appia's assay data indicates that the value of the REEs present will largely vest in cerium, lanthanum, neodymium and yttrium which account for 86.3% of the total REEs present in the sample population at large. These specific metals account for 88.4% of the REEs present in the Indicated Resources and 90.1% of the REEs present in the Inferred Resources.

It is important to note that the foregoing resource estimate does not invalidate the previous (2008) uranium-only resource estimate. When taken together in proper context, the two estimates shed considerable light on the economic potential of the Teasdale Deposit that has not been considered until now. The close relationship between REE and uranium mineralization has been known for some time even if not well documented in the available literature. The commercial viability of REE mineralization was previously demonstrated by the historical recovery of yttrium as a by-product of uranium production at the Elliot Lake mines. These operations proved that separate facilities were not required to leach the REEs, and that once in solution, yttrium could be easily recovered.

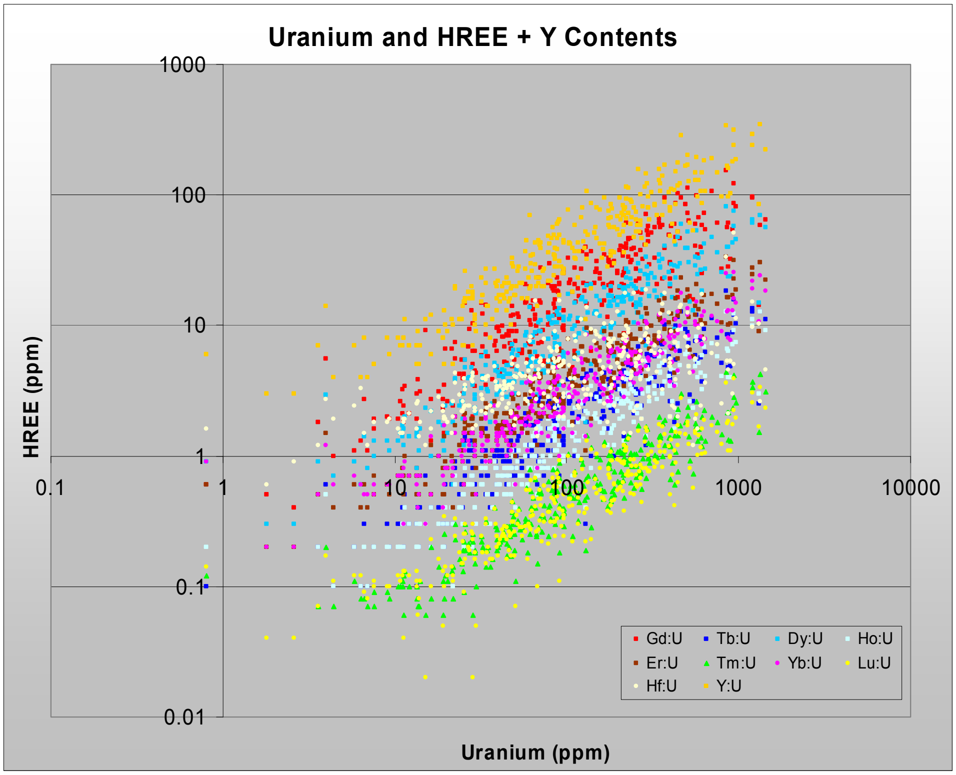
However the mine operators ignored the other REEs because the market was adequately served by deposits elsewhere.

This close association between U and REEs is clearly demonstrated in the following graph (Figure 23) which shows the associations between the individual rare earth metals and uranium. REE contents are highest for cerium, lanthanum and neodymium. Correlation coefficients for uranium and rare earth metals are summarized as follows:

U:LREE	0.528	U:HREE	0.834	U:TREE	0.558
U:Y	0.856	U:Sm	0.662	U:Ho	0.886
U:La	0.573	U:Eu	0.743	U:Er	0.884
U:Ce	0.586	U:Gd	0.877	U:Tm	0.888
U:Pr	0.590	U:Tb	0.886	U:Yb	0.881
U:Nd	0.599	U:Dy	0.877	U:Lu	0.847
				U:Hf	0.318

WGM believes that the close association between the uranium and rare earth metals supports suppositions regarding the areas of the Teasdale Deposit defined by historical drilling but untested by Appia. If the U-REE resource is extrapolated in a linear sense to cover the entirety of the Teasdale Deposit as previously estimated by WGM, then the total REE resources would be expected to increase substantially given that the total contained uranium outlined to date is approximately 19 Mlbs (Indicated) and 53 Mlbs (Inferred). If the REE:U ratio is sustained throughout the deposit, then the Teasdale Zone as outlined by historical and current drilling should contain between 400 to 450 Mlbs of total REEs[26] at an average grade of approximately 3 to 4 lbs/ton, most of which will be La ($93/kg), Ce ($96/kg) and Nd ($150/kg) with significant amounts of Y ($105.50/kg), Gd ($100.50/kg) and Pr ($138.50/kg). In WGM's opinion, this represents the conceptual exploration target for the Teasdale Zone that is now being explored by Appia. The potential quantity and grade is conceptual in nature, there has been insufficient exploration to define a mineral resource and it is uncertain if further exploration will result in the target being delineated as a mineral resource. As shown in Table 31, these current prices enable the REEs to add considerable value (>$100/ton) to Teasdale mineralization over and above the value of the uranium. As the Teasdale Deposit is not currently well constrained by drill hole data, and is open laterally in all directions, the expected TREE content should be greater yet although additional drilling as recommended in this report will be required to prove or disprove this concept.

[26] Equivalent to the total contained uranium oxide in the 2008 WGM uranium-only resources estimate for the entire Teasdale Zone divided by the uranium oxide contained in the current resource estimate based solely on the recent Appia drilling and then multiplied by the current TREE content.



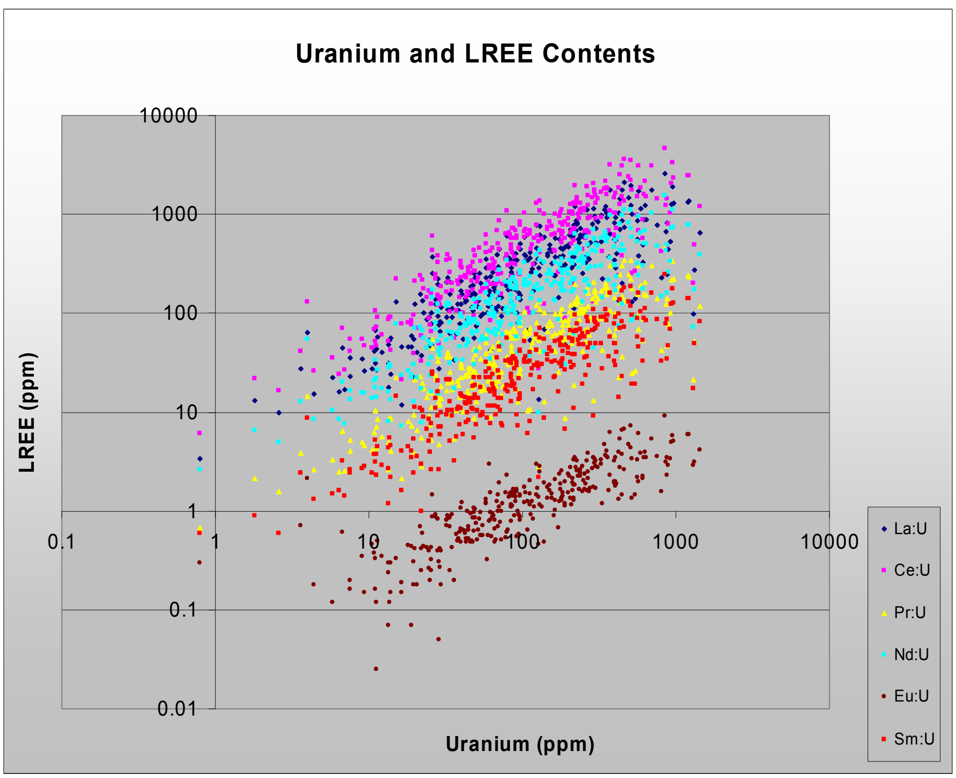


Figure 23 Illustrations of the Close Correlation Between Rare Metals and Uranium Contents in Appia Drill Holes.

The aforementioned uranium-REE resources offer a different and arguably more representative approach to the resources of the Teasdale Deposit, however REE data is available for only a small part of this zone. For reasons of full disclosure and comparison as well as clarity, the 2008 resource estimate text is presented in the Appendices.

Pele Mountain Resources' Eco Ridge uranium project is on an "Adjacent Property" in the context of NI 43-101. Recent resource estimates by the companies independent consultants (QP's), Roscoe Postle Associates Inc. ("**RPA**") have reported that the Eco Ridge deposit presently contains Indicated Resources of 14.31 Mt grading 0.048% U_3O_8 (0.96 lbs U_3O_8 per ton) and 0.164% total rare earth elements ("**REE**"s) or 3.28 lbs/ton with additional Inferred Resources of 33.12 Mt grading 0.043% U_3O_8 (0.86 lbs U_3O_8 per ton) and 0.132% total REEs or 2.64 lbs/ton (Ciuculescu, 2011). The total contained metal was 15.2 million pounds of U_3O_8 and 51.9 Mlbs of REEs in the Indicated category and 31.4 Mlbs of U_3O_8 and 96.4 Mlbs of REEs in the Inferred category.

During July, 2011, Pele announced the RPA's Preliminary Assessment for the Project, which included the following key findings based on a 9,400-tonne per day operation with life-of-mine production of 10.7 Mlbs of total rare earth oxides (REOs) and 24.9 Mlbs of U_3O_8 over a 14-year mine life:

- cumulative operating cash flow of US$1.72-billion
- cumulative pre-tax cash flow of US$1.31-billion
- positive NPV of $533 million (at a 10% discount rate)
- internal rate of return (IRR) of 47 percent (47%)
- operating cash cost of US $16 per pound U_3O_8, net of REO credits
- start-up capital costs of US $212 million and sustaining capital costs of US $195 million.

WGM believes that the Teasdale Lake Zone is very comparable to Eco Ridge except that the Teasdale Zone appears to be significantly thicker (7.22 m versus 2.76 m) whereas the grades are less directly comparable due to Pele's focus on the uranium cut-off grade:

Teasdale Zone	Eco Ridge
3.62 lbs TREE/ton (Inferred)	3.28 lbs TREE/ton (Indicated) 2.64 lbs TREE/ton (Inferred)
0.62 lbs U3O8/ton (Inferred)	0.96 lbs U3O8/ton (Indicated) 0.86 lbs U3O8/ton (Inferred)

As with the Teasdale Lake Zone, the Banana Lake Zone is unconstrained by geological limits at this time. There is substantial potential for the resources in both zones to be up-graded and increased in size with additional diamond drilling.

20.3 HISTORICAL URANIUM AND THORIUM RESOURCES

The historical uranium resources present on the Appia claims are all considered to be non-compliant with current statutory requirements under Canadian Securities regulation NI 43-101. These estimates by Rio Algom were based on a limited number of deep, widely spaced Kerr McGee diamond drill holes, data provided from holes drilled by additional exploration companies in other areas of the Property, operating data from Rio Algom's mines and the fact that mining experience proved that the uranium-bearing horizons demonstrated remarkable lateral and down dip continuity over a very large area. Rio Algom's estimates increased the total remaining uranium resource to approximately 200 million pounds of U_3O_8 as follows:

Teasdale Lake Zone	17,458,200 tons	at 1.206 lbs U_3O_8/ton	(20,787,200 lbs)
Gemico Block #3 Zone	42,800,000 tons	at 0.38 lbs U_3O_8/ton	(16,264,000 lbs)
Gemico Block #10 Zone	20,700,000 tons	at 0.75 lbs U_3O_8/ton	(15,525,000 lbs)
Banana Lake Zone	175,800,000 tons	at 0.76 lbs U_3O_8/ton	(133,608,000 lbs)
Canuc Zone	7,000,000 tons	at 1.86 lbs U_3O_8/ton	(13,020,000 lbs)
Total	263,758,200 tons	at 0.76 lbs U_3O_8/ton	(199,204,200 lbs)

The foregoing estimates are believed to have been authored by Doug Sprague, P.Eng., formerly Chief Geologist of Rio Algom and are shown on a Rio Algom map (Rio Algom, 1979). The resources were not estimated in accordance with definitions and practices established for the estimation of Mineral Resources and Mineral Reserves by the Canadian Institute of Mining and Metallurgy ("**CIM**"). As such, the historical resources are not compliant with Canada's security rule National Instrument 43-101 ("**NI 43-101**"), and should not be relied upon used for investment decisions. In most cases, the input data for the resource estimates are well known to WGM, at least in respect to the deep drill hole intersections on which the estimates were based. However, the geological assumptions on which the resources are based is of uncertain validity even taking into account the considerable experience of companies such as Rio Algom in making such estimates. As a result, the potential quantity and grade is conceptual in nature and only represents an exploration target.

At this time, there has been insufficient diamond drilling to confirm the aforementioned historical estimates and it is uncertain if further exploration will result in a resource of similar grade and tonnage being outlined that is compliant with NI 43-101. Neither Appia nor its Qualified Persons have done sufficient work to classify the historical resources as current mineral resources under present NI 43-101 and CIM standards, and the historical resources estimates are not being treated as current mineral resources. Nevertheless, Appia's initial drilling, including twinned holes, has confirmed much of the original drill data on which the foregoing Teasdale and Banana Lake estimates were based. WGM believes that the historical estimates can therefore be classified as something better than mere mineralization, notwithstanding the foregoing limitations. Clearly, additional drilling is needed to confirm the existing uranium intersections. WGM believes there is excellent potential for many of the zones to increase in size as the former estimates were highly constrained by the claim boundaries of the individual companies, a limitation that no longer exists on the Appia Property.

As an adjunct to the uranium resources, it must be noted that Stanrock mine tailings carried 0.87 lbs thorium oxide (ThO_2) and 0.66 lbs rare earths per short ton, much of it contained in the mineral monazite (Robertson and Steenland, 1960). If this can be used as a general order-of-magnitude rule for all Elliot Lake mines, and WGM is not certain that this is necessarily the case, then the 180 Mt of ore mined and processed should equate to approximately 125 to 175 Mlbs of ThO_2 in tailings. As a conceptual exploration target that is easily accessible, systematic sampling would be required to determine the precise tonnage and grade of the tailing, and there is no assurance that the thorium and rare earths would be exploitable. The value of the thorium and the rare earths is conditional, the former on the future development of thorium reactors and the latter dependent on a commercial use for the remaining rare earth metals. Thorium reactors have been discussed since the 1970s, but as far as WGM is aware, India is the only country with an established development program. Interestingly, Canada's CANDU reactor can operate on blended uranium-thorium fuel cycles. Only an extreme shortage of uranium fuel would cause a significant shift in the energy commodity markets in favour of thorium, and so the Elliot Lake thorium resource must be thought of in a long-term, context. The estimated 110 to 130 Mlbs of contained rare earth elements in tailings is a substantial, albeit low-grade exploration target. If future supply shortages result in an improved market for these commodities, the potential value of the REEs in tailing might be economically interesting as this represents a readily leachable source.

20.4 MINING AND PROCESSING

The total uranium production from all Elliot Lake mines was some 362 million pounds of U_3O_8 from approximately 167 million tons of ore. At today's Term Price ($65/lb), this metal would have a gross value of $23.5 billion. The Denison mines produced some 156 Mlbs of U_3O_8 from ore grading approximately 2.1 lbs U_3O_8 per ton. The Rio Algom mines produced approximately 206 Mlbs of U_3O_8 from ore grading approximately 2.3 lbs U_3O_8 per ton. Total production data (tonnes, grade, recovered U_3O_8) from individual mines is not well documented in public sources. Complete records may be available from official archives, however this information has not been well documented in industry or in research publications.

Mining was predominantly by conventional room and pillar underground methods. As the later mining operations were forced to rely on lower grade ores, several attempts were made to adapt bacterial leaching and in-situ leaching to the uranium ores. Although the percentage recovery of uranium was apparently acceptable, as the practice was continued and enlarged, both Rio Algom and Denison seemingly recognized that such time-consumptive procedures could not be relied on to generate the amount of uranium production (revenue) needed to support a large mining operation. Uranium recovery via in-situ leaching, as well as heap leaching, from Blind River deposits is impeded by the highly indurated character of the ores and their low primary permeability, thus forcing the use of very fine grinds to recover even half of the uranium. At the Agnew Lake Mine, Kerr Addison Mines Ltd. made similar attempts at in-situ leaching by flooding a sealed stope with leachate, however, it is clear that the uranium production achieved (50% recovery) was not as high as was expected. Kerr Addison also attempted heap leaching low-grade ores on surface with a similar rate of recovery.

WGM also reviewed the possibility of underground acid-leaching of pillars, either in situ or through a program of blasting out the pillars, and concluded that this offered the potential of recovering a substantial amount of uranium still contained in the existing mines. The process offers several attractive features including a significantly reduced capital cost over conventional mining and milling although the required leach time is significant to achieve a favourable recovery. WGM believes additional study is required to more completely investigate this possibility.

In reviewing how low grade operators achieved success in such places as New Mexico, Appia should examine the potential cost savings of constructing a central processing facility in co-operation with other potential uranium producers in the Elliot Lake area. Given the high capital cost considerations, it makes little sense for each company to build its own processing infrastructure.

20.5 URANIUM COMMODITY OUTLOOK

The increase in uranium prices seen during 2006 and 2007 was dramatic, yet in constant dollar terms, the price remained below its previous highs set during the 1977-1979 period. In looking towards the future, it can be demonstrated that uranium supply will be responsive to commodity price signals, both when prices are weakening and when they are rising. Uranium prices respond in much the same manner to the supply/demand cycles as other metals as well as the oil and gas (energy) market. Historically, there has been a strong tendency for uranium prices to overshoot the point of equilibrium, both in rising and in falling markets. WGM believes that the low-point in uranium prices seen during early to mid-2009 is typical of prices that have fallen unjustifiably low due to the current economic crisis. Relatively strong markets developed historically in the 1960s and 1970s due to strategic military stockpiling programs by governments, and by reactor construction by energy utilities. Weak markets have been distorted by governments artificially supporting producers through price support programs and, in the case of the United States, by closing its domestic markets to foreign suppliers. At this time, and for the foreseeable future, WGM anticipates a more open, market-oriented price than has been the case in the past.

For a variety of reasons, the uranium industry has been highly politicized. The accumulation of huge uranium inventories during the 1960s, 70s and 80s caused uranium prices to fall through the cost floor, and these resources were consumed at far below the cost of replacement. Additional sources of uranium fuel from highly enriched uranium (weapons grade or HEU), principally from Russia, has also put downward pressure on prices. The exhaustion of the uranium stockpile, the declining tendency for the Russians to convert HEU to fuel grade uranium, and sharply increased or planned increases to reactor construction has awakened a sleeping mining and mineral investment community to the looming shortage in reactor fuel. The sharp upward movement in uranium prices seen in 2006-07 resulted in some new sources of uranium being advanced towards production and planned increased in output at mines such as Olympic Dam.

Current reactor demands are being met, more or less, by existing sources of supply and through long term contracts. The key question is whether future demands from new reactors can be satisfied through the development of known deposits in countries such as Australia and through new discoveries, some of which are in Canada? Key resources in countries such as Mongolia have been tied up as a result of political wrangling, and governments being unduly influenced by competing foreign interests. In the current economic climate, there is a great amount of uncertainty as western utility companies and governments postpone nuclear programs for budgetary reasons. The Fukushima disaster had cast a cloud over the entire nuclear industry, however China and India are forging ahead with their own reactor construction plans. In Canada, the province of Ontario has announced the awarding of contracts for the construction of two new CANDU reactors at the Darlington nuclear power station. Based on the outcome of Sweden's stated 1979 goal of becoming nuclear-free by 2010, and its domestic reliance on even more reactors now than it had then, WGM is highly doubtful that Germany and Japan will actually follow through with statements indicating a desire to become nuclear-free. Neither country has alternative means of replacing the base load generating capacity represented by its nuclear plants. Germany would become even more dependent on nuclear reactors located in France. Japanese industry would become dependent on electricity generated by new oil or gas fired generators, hardly a "green" alterative. Reportedly, Japan has under-utilized geothermal capacity but this is not seen as a substantial replacement to the base load capacity of the country's nuclear electric industry.

The June quarterly on the uranium energy sector by metal market researchers Resource Capital Research Pty. Ltd. ("**RCR**") stated "The sector has faced near term uranium price uncertainty since the crisis in Japan, as well as broader equity market concerns over slow US economic activity and ongoing sovereign debt issues in the advanced economies" (RCR, 2011). RCR concluded that "Despite the short term market impact of Japan, the long term uranium market fundamentals are considered sound with expected strong and increasing demand for new nuclear power reactors, especially from China, USA, Russia, Ukraine and India. While Germany has announced it will close all 17 of its nuclear power reactors by 2022 (with 7 to remain closed with effect from the March 2011 moratorium), many countries have publically stated their strong continued commitment to nuclear energy, most notably, and arguably of greatest influence, the US." WGM is of the opinion that, like in the case of Sweden, Germany's stated non-nuclear energy goals will be unattainable unless the German public are willing to import more and more of their energy needs from highly nuclear neighbours such as France. RCR further concludes, "While the impact of the Japanese quake is expected to impact discretionary inventory purchases, and further delays to new reactor construction programs are anticipated, the impact on the contract ("Term") price is expected to be temporary, with the price remaining around the US$60-75/lb mark.

WGM believes that future uranium prices will be significantly higher than those that exist at the moment. In the complete absence of an accumulating international uranium stockpile, and with the participation of hedge funds in the market, spot market pricing is likely to be more volatile in the future than in the past. The inversion of the spot (discount) price and the term price is a good indicator of a robust short term market. The term price is expected to be largely unaffected by the hedge funds because the contracted volumes under term agreements much larger than those in "play" on the spot market. The term market therefore tends to be the best indicator of actual supply-demand dynamics.

As with many mineral commodities, demand from China has the potential to tip the balance between surplus and deficit. China is currently expanding its nuclear capacity with 11 nuclear reactors in operation, 17 recently passing their safety approval and 13 under construction. With a planned capacity of 70 GW by 2020, China's requirements for nuclear fuel will demand that approximately 12,000 tonnes of natural uranium be processed into fuel assemblies each year (China, 2009). Having an annual production capacity of less than 1,000 tonnes of uranium at this time, satisfying less than half of China's current needs, the country's imports from foreign sources is expected to soar. Without substantial new discoveries within the country, its import requirements will be significant. Based on reactors constructed and in construction, this demand will be in excess of 25 M lbs per year.

Extreme differences exist between today's uranium market and the conditions that prevailed during the uranium boom that occurred during the 1970s. The usefulness of making comparisons is limited. One can only conclude that uranium prices in today's market should exceed those which existed at a time when a substantial uranium stockpile was accumulating. The energy sector in general has been pushed to new highs on the back of uncertainties concerning oil and gas supply shortages much as it was during the 1970s. To some extent, uranium prices have benefited accordingly. The negative environmental consequences of greater coal reliance are better understood now than in the 1970s, and this makes a convincing case for greater reliance on nuclear power generation. This fact is not lost on the Australian environmental movement which has until now been staunchly anti-nuclear. While WGM has analysed many of the factors influencing the historical and current uranium markets in this report, a detailed market study is required to better understand the future trends in demand and supply especially since Australia is emerging from a long period of production limitations and the production from countries such as Kazakhstan is growing quickly.

20.6 REGULATORY AND OTHER CONSIDERATIONS

Insofar as WGM has determined though its limited discussions with government representatives in Sault Ste. Marie, there are no impediments in the mining and environmental statutes that would constitute fatal flaws to the Appia project. There are no land withdrawals in the Appia project area that would negatively impact Appia's exploration plans. However, prior to taking on any exploration activity associated with the previous mines, further discussions are certainly required with the umbrella organization responsible for the Elliot Lake remediation program and with its constituent members. Extreme care will be required in working around areas that are thought to be "restored", if any yet exist.

The sustained effort to restore the Elliot Lake watershed to its original condition has been costly and this will be a particularly sensitive subject insofar as local communities are concerned. Appia will be able to point to the great success achieved to date which should offset concerns. In its discussions with local mining engineer, Bob MacGregor who has been active with Pele Mountain Resources, WGM understands that the residents of Elliot Lake and its Chamber of Commerce are intensely interested in the new jobs and tax revenue that renewed mining would bring to the town. Appia should follow up with town officials in establishing its own presence and credibility.

21. RECOMMENDATIONS

21.1 MINERAL ECONOMICS

The international market for rare earth metals has increased markedly as, at the same time, traditional sources have contracted. WGM recommends that Appia carry out an initial study of the amounts of REE metals present in the Elliot Lake tailings as part of a long-term strategy. The reprocessing of such tailing has the potential to provide early cash flow to a new mining project.

The supply and demand fundamentals of the uranium market are dynamic but subject to easily quantified measurements since reactor demand can be forecast based on power generating capacity. Like new uranium mines, reactors also require considerable time for planning and construction and this allows surpluses and deficits in uranium markets to be forecast with a high degree of certainty relative to other mineral commodities. Nevertheless, uranium deposits are becoming increasingly difficult to find, and the permitting of such deposits is requiring longer and longer lead times. If past experience is a measure, uranium fuel fabricating infrastructure is likely to lag mine output. Over the longer term, key factors will be substantially increased demand due to new reactor builds balanced against increasing production from Australia and Kazakhstan, and new production coming from countries such as Mongolia that had little or no output in the past. As a medium term goal, Appia should undertake a detailed review of the uranium industry to ensure its understands the market as it is foreseen to develop in the next two decades.

The recent findings of the World Nuclear Association, which meets every two years (most recently in September 2009), should be taken as a guide to overall plans, however in this period of great economic turmoil, the forecasts of most experts contain a wide area of uncertainty between high market and low market scenarios. WGM is uncertain whether the current findings are useful in this economic climate, and so Appia's economic study should be completed no sooner than 2012.

It is without doubt that the Elliot Lake deposits offer the potential for a stable, long term supply of uranium oxide and rare earth metals. WGM believes that the world will not indefinitely ignore the presence of more than 200 million pounds of readily extractable uranium remaining in the Elliot Lake deposits, and many times that in pounds of rare earth metals.

21.2 EXPLORATION AND ENGINEERING STUDIES

WGM tenders the following recommendations which have been numbered for convenience.

1) An attempt should be made through Natural Resources Canada (NRCan) archives and other sources including library records (microfiche and digital records) to assemble a complete production and exploration history for the Elliot Lake camp. This should include purchasing copies of all published books, reports and other information on the history of Elliot Lake.

2) Potential uranium and rare metals resources in the Teasdale Lake area should be explored by diamond drilling as follows:

   a. re-entering historical holes and placing by-pass wedges approximately 5 m above the uppermost uranium reef to provide the opportunity for a second cut through the mineralization to allow new core for analysis to provide the REE data missing from the historical assay records and to allow for confirmatory uranium analyses;
   b. new holes drilled from surface to provide in-fill intersections to the existing drilling pattern thereby increasing the confidence level of the Mineral Resources and converting Inferred Resources to Indicated Resources;
   c. new cuts through mineralization by wedging off existing deeper drill holes in a similar manner to that used by Appia for the Banana Lake Zone.

   A provisional drilling program recommended for the Teasdale Lake Zone is presented in Figure 24. Individual drill sites are not prioritized within this selection of recommended drill sites.

3) The uranium and REE Mineral Resources of the Teasdale Lake Deposit should be up-dated after the recommended drilling is completed.

4) Additional work needs to be done to precisely determine the locations for new drill sites to test and enlarge the Banana Lake Mineral Resources. This drilling should be staged in accordance with the plan represented in Table 37 as follows with the location of drill sites adjusted according to the results achieved. A provisional layout of these drill holes is provided in Figure 25. The Banana Lake drilling is considered to be a second priority task at this time as the drilling

to date has essentially confirmed the viability of the historical estimate made by Rio Algom. There is clear potential for defining nearly 200 Mlbs in this zone.

Table 37
Summary of Proposed Drill Hole Locations in the Banana Lake Zone

Drill Site	Approximate Location	Length (m)	Justification
First Priority Drill Holes			
A	1,200 m east of KM150-5 (Appia BL 07-01) site	1,600	Tests favourable area between first Appia drill hole and Kerr McGee hole KM150-2
B	600 m NNW of KM156-5	1,600	Tests favourable area north of Appia hole drilled using the KM156-5 casing and pilot hole.
Second Priority Drill Holes			
C	1,100 m WNW of KM156-5	1,600	Tests favourable area northwest of current mineral resources area.
D	1,400 m NNW of KM156-5	1,600	Tests favourable area northwest of current mineral resources area.
E	900 m west of KM156-5	1,600	Tests favourable area west of current mineral resources area.
F	600 m SE of KM150-2	1,600	Tests favourable area southeast of Kerr McGee hole KM150-2 which intersected 0.68 lbs U_3O_8 per ton over 3.4 m (11 ft)
Third Priority Drill Holes			
G	600 m NE of KM156-1	1,600	Tests area northeast of Kerr McGee drill hole KM 156-1 which intersected 1.76 lbs U_3O_8 per ton over 0.6 m (2 ft).
H	450 m south of KM150-4	1,600	Tests area between south of Kerr McGee drill hole KM 150-4 which intersected low values and the area of current mineral resources.

5) Where practical, the redrilling of the existing Kerr McGee holes and wedging from such holes is justified as a means of quickly and cost-effectively building a uranium resource base in some areas of the Appia property. Wedging off-hole at a distance of 300-400 m above the Matinenda Formation should produce additional intersections at least 30 metres away from the initial pierce point. By using multiple wedged holes in this way, the variability of mineralization can be tested and the resource potential assessed at a significantly lower cost that redrilling from surface.

6) All core from new drill holes must be logged and analysed for U and REEs in accordance with established industry practices. At this time, provided that core recovery is 95% or better, WGM does not see a significant advantage in down-hole radiometric (spectrometer) logging over the use of a hand-held spectrometer, however down-hole surveying should be used if core recoveries are less than optimal. All drill core samples should be analysed for uranium using a solvent (acid) extraction process rather than by neutron activation

using a solvent (acid) extraction process rather than by neutron activation analysis (which measures total contained uranium rather than leachable uranium). All samples should be analysed for the rare earth elements using a conventional technique and for trace elements using a ICP-based multi-element technique.

7) On completion of the Teasdale mineral resource estimate, a Preliminary Assessment ("**PA**") should be completed on the Teasdale Deposit, part of which should be an assessment of access options including the feasibility of dewatering the existing Panel Mine workings. The PA should also evaluate the feasibility of dewatering the existing mine workings under the Appia claims for the purpose of in-situ acid leaching of ore developed through the taking down of existing underground pillars and flooding the workings with leachate. This option is not as capital intensive as conventional mining and avoids the issues connected with tailings disposal, however achieving an acceptable recovery in an satisfactory leach time will be dependent on attaining optimum sizing of the broken ore – this would likely be the most critical factor.

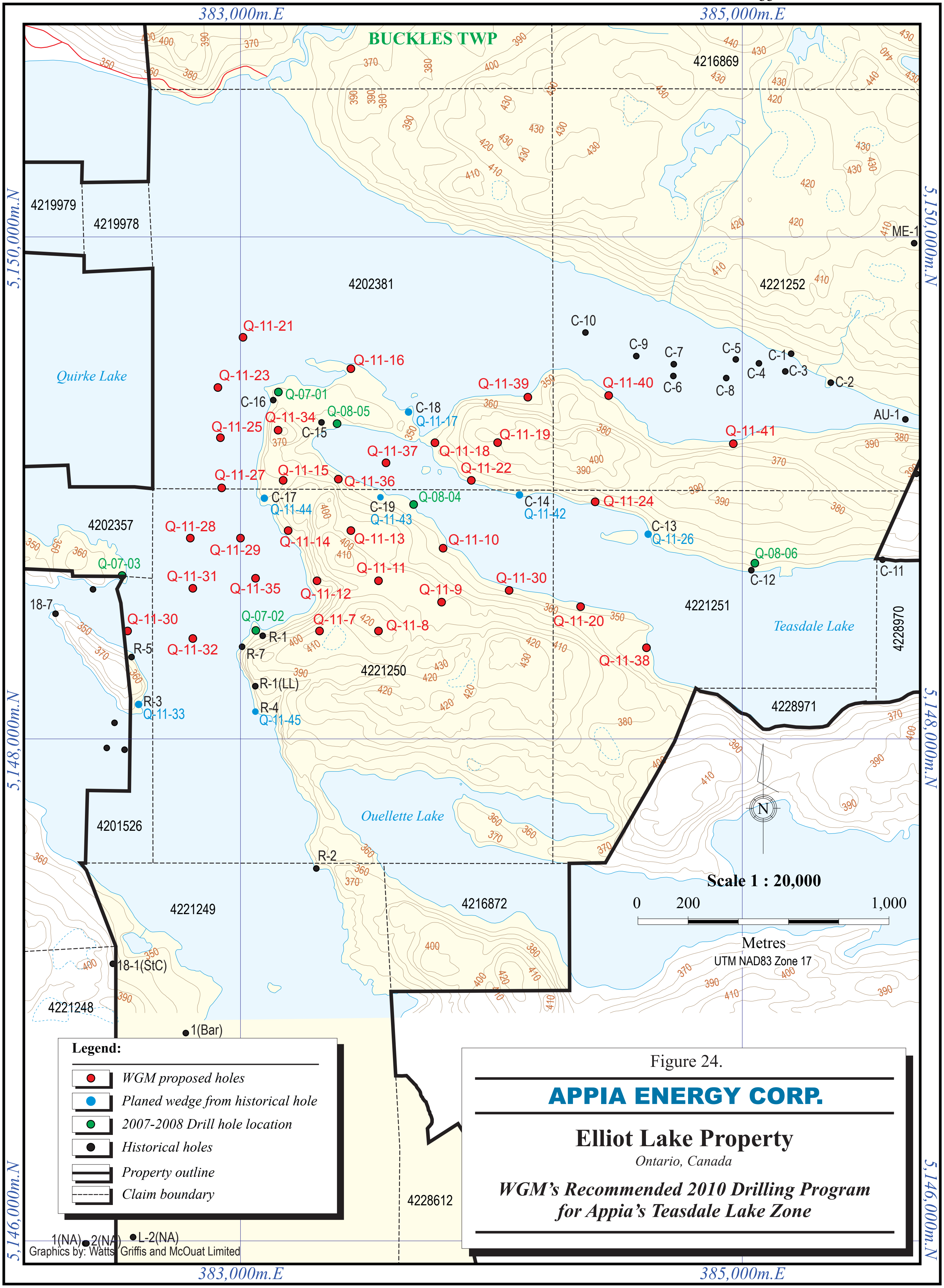
8) The WGM NI 43-101 compliant resource estimates should be up-dated periodically as new drill hole results become available especially, as noted in the foregoing, for the Teasdale Lake Deposit.

9) A dialogue should be initiated with Pele Mountain Resources to explore the feasibility of constructing a central milling and processing facility for Elliot Lake ores as a means of improving the economic viability of individual projects. All discussions would necessarily be contingent on the discovery of a resource base of sufficient size and grade to justify a production decision.

10) A dialogue should be initiated with government authorities to determine how best Appia can carry forward its exploration on certain of its claims that now have restricted access due to on-going impact mitigation work, and are thus subject to restrictions on surface activities.

APE REP / APE_07_DH_Recomende_Teasdale_Lake.cdr
Last revision date: Wednesday 9 December 2009

Watts, Griffis and McOuat



APE REP/ APE_10_DH_Recomended_Banana_Lake.dwg (Layout: 25k Banana Lake)
Last revision date: Wednesday 19 July 2011

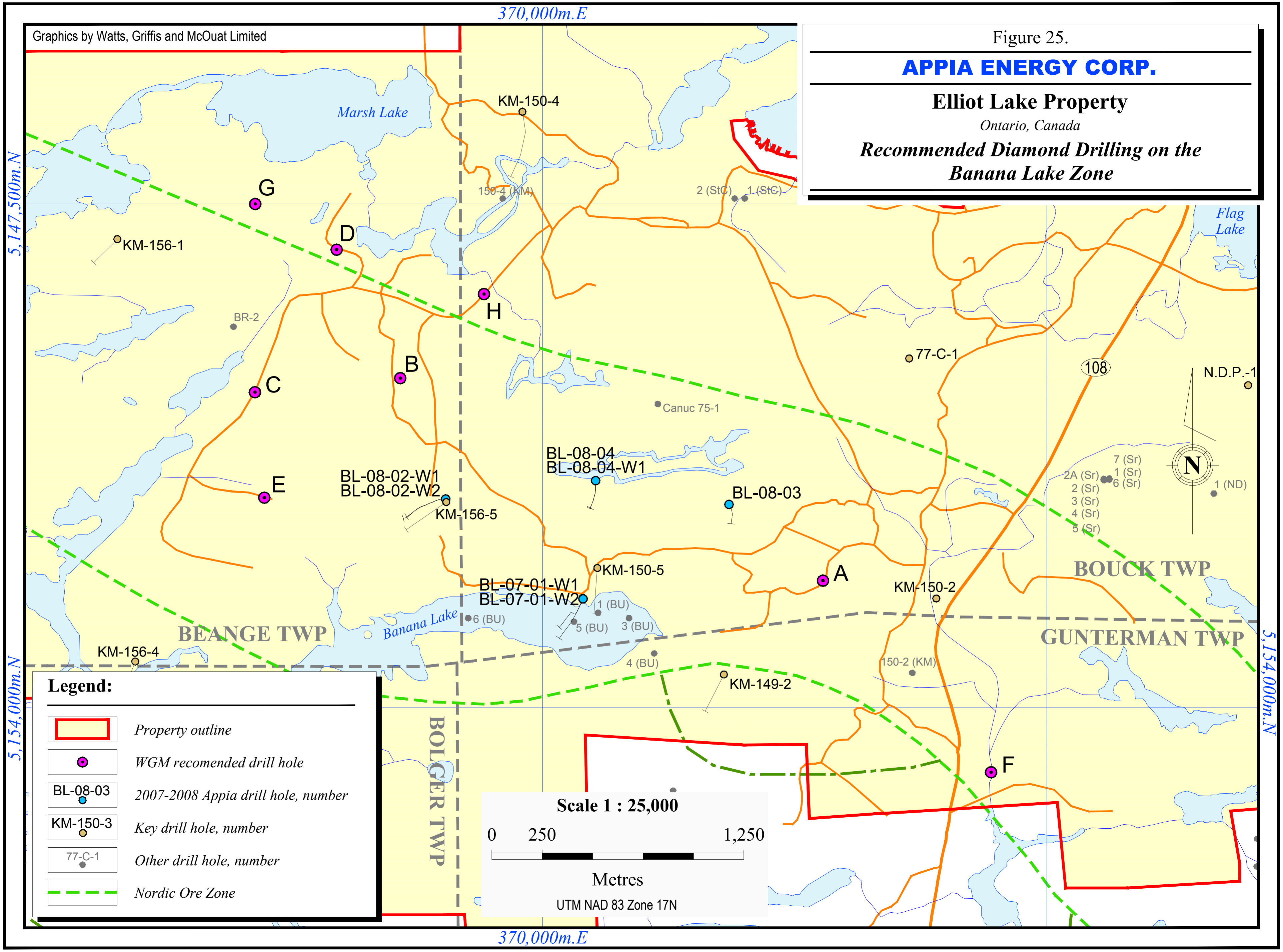


Figure 25.

APPIA ENERGY CORP.

Elliot Lake Property

Ontario, Canada

Recommended Diamond Drilling on the Banana Lake Zone

Watts, Griffis and McOuat

21.3 PUBLIC DIALOGUE

Appia must act proactively to ensure that its activities are consistent with government regulations and policies. Appia should open direct contact with the Elliot Lake Joint Review Commission and its constituent members, the Ontario Ministry of Northern Development and Mines, the Ontario Ministry of Natural Resources, the Ontario Ministry of the Environment, the (Federal) Environment Canada and the Federal Department of Fisheries and Oceans.

The new Ontario Mining Act currently before the Provincial Legislature is due to come into force in the near future. The new law will be accompanied by new regulations under the Ministry of Natural Resources. Collectively, the new regulations are not likely to affect Appia's land tenure rights as WGM understands that such affects are only to be found in the northern part of the Province. However, the new law carries requirements that will dictate that First Nations peoples be increasingly engaged in the decision-making process. It is unclear how this will affect Appia's exploration activities at it's work should be classified as an early stage project. WGM understands that very little consultative work is required at this time, however Appia's management should familiarize itself with the new laws. Future development planning will require that the company study the implications of new law and, if deemed necessary, engage suitable counsel to give it guidance relevant to its planning process.

As the Elliot Lake mine sites are under the administrative jurisdiction of the Canadian Nuclear Safety Commission ('**NSC**"), Appia should also contact this federal body to ensure that its activities are known to those responsible for overseeing the regulation and monitoring of the Elliot Lake nuclear infrastructure, and for setting objectives for the Joint Review Commission.

First Nations ("**FN**") communities are located in watersheds down-stream from the former mining operations. Early consultation is recommended with FN representatives to ensure an inclusive rather than exclusive dialogue. Marginalizing this community may spawn groups that are especially resistant to uranium mining. Appia must be prepared for opposition to exploration and should develop an open dialogue with Pele Mountain Resources which may be in the same situation in respect to its nearby project.

22. PROGRAM BUDGET

WGM has identified a staged exploration program that, over time, minimizes risk by building slowly from the established facts concerning the historical work. WGM proposes a budget of C $14,600,000 for a multi-year exploration drilling project according to the following budget (Table 38). Additional costs totalling $670,000 for data acquisition, public forums, supporting surveys and studies are detailed in Table 39. We believe that this exploration is justified based on the positive results of Appia's initial exploration programs. The drilling is divided between 15,405 m on the Teasdale Lake Zone and 17,600 m on the Banana Lake Zone. In carrying out this work, drilling on the Teasdale Lake Zone offers Appia the greatest potential for adding value to the project in the form of NI 43-101 compliant uranium and rare metal Mineral Resources.

The proposed exploration work will substantially exceed Appia's needs insofar as exploration assessment requirements are concerned. All costs are in Canadian dollars. To place this budget in context, it represents an investment of less than 10 cents (Canadian $0.10) per pound of historical uranium oxide resources on the Appia exploration property if the previous estimates of Rio Algom and others can be shown to be correct. It represents an investment of 16 cents per pound (Canadian $0.16) per pound of uranium oxide resources currently outlined to NI 43-101 standards on the Appia Property.

The Banana Lake drilling, comprising 8 deep drill holes and 8 wedged holes, is proposed to test the northerly, westerly and south-easterly extensions of mineralization originally discovered by Kerr McGee and recently confirmed by Appia. For planning purposes, three phases of drilling are proposed for budgetary and cash flow reasons. This program should be executed in a flexible manner that is responsive to actual results. Drill hole locations do not significantly influence hole depth, but certainly may influence overall results in respect to uranium contents. Careful attention to the geology of the uranium-bearing zones (reefs) is required. In some areas, the hole locations may allow for slightly shallower uranium intersections as the zone is traced to the north and away from the centre of the basin, but drill site elevation (above sea level) will probably have a greater impact on hole length. A budget is also provided for wedging off the new holes to allow Appia to develop additional cuts through mineralization using the original hole as a pilot. These wedged holes can be used to demonstrate grade and thickness continuity.

Table 38
Appia Energy Corp. Budget for Diamond Drilling and Associated Work, 2011-12

Item		Description	Amount	Unit Cost	Unit Totals	Total
Exploration Drilling						
Teasdale Lake Zone	Phase 1	12 diamond drill holes on Teasdale Lake Zone including re-entering historical holes to up-grade resources and collect new REE data	4,000 m	$250	$ 1,000,000	
		Helicopter Support for drilling	on 4,000 m		310,000	
		Project Management and Geological *	on 4,000 m	approx $60/m	240,000	
		Assaying	1,828	$50	91,400	
		Room & Board *	on 4,000 m	approx $10/m	40,000	
		Consumables & Miscellaneous Costs *	on 4,000 m	Approx $5/m	20,000	
		Contingency on Subtotal	~5% of costs above ($1,701,400)		66,350	
		Sub-Total for Phase 1 Drilling			$ 1,767,750	
	Phase 2	15 in-fill diamond drill holes on Teasdale Lake Zone to up-grade resources	6,000	$250	$ 1,500,000	
		Helicopter Support for drilling	on 6,000 m		470,000	
		Building ice platforms for drill sites		$10,000	120,000	
		Project Management and Geological *	2,856	approx $60/m	360,000	
		Assaying	2,742	$50	137,100	
		Room & Board *	on 6,000 m	approx $10/m	60,000	
		Consumables & Miscellaneous Costs *	on 6,000 m	approx $5/m	30,000	
		Contingency on Subtotal	~5% of costs above ($2,677,100)		135,000	
		Sub-Total for Phase 2 Drilling			$ 2,802,100	
	Phase 3	12 in-fill diamond drill holes on Teasdale Lake Zone to up-grade resources	5,405 m	$250	$ 1,351,250	
		Helicopter Support for drilling	on 5,405 m		420,000	
		Project Management and Geological *	on 5,405 m	approx $60/m	324,300	
		Assaying	2,470	$50	123,500	
		Room & Board *	on 5,405 m	approx $10/m	54,100	
		Consumables & Miscellaneous Costs *	on 5,405 m	approx $5/m	27,000	
		Contingency on Subtotal	~5% of costs above ($2,300,150)		130,000	
		Sub-Total for Phase 3 Drilling			$ 2,430,150	
			Total for Teasdale Lake Zone Drilling			$ 7,000,000
Banana Lake Zone	Phase 1	2 diamond drill holes to test SE & NW extensions of Zone	3,200 m	$300	$ 960,000	
		2 wedges (including rig and crew time)	2	$20,000	40,000	
		2 wedged holes from initial pilot holes	1,200 m	$500	600,000	
		Project Management and Geological	4,400 m	$30	132,000	
		Assaying Samples	500	$32	16,000	
		Room & Board	4,400	$10	44,000	
		Consumables & Miscellaneous Costs	4,400	$5	22,000	
		Contingency on Subtotal	5% of costs above ($1,836,000)		86,000	
		Subtotal for Phase 1 Drilling			$1,900,000.00	
	Phase 2	4 diamond drill holes to test NW & SE extensions of Zone	6,400 m	$300	1,920,000	
		4 wedges (including rig and crew time)	4	$20,000	80,000	
		4 wedged holes from initial pilot holes	2,400 m	$500	1,200,000	
		Project Management and Geological	8,800 m	$30	264,000	
		Assaying Samples	1,000	$32	32,000	
		Room & Board	8,800 m	$10	88,000	
		Consumables & Miscellaneous Costs	8,800	$5	44,000	
		Contingency on Subtotal	5% of costs above ($3,672,000)		172,000	
		Subtotal for Phase 2 Drilling			$ 3,800,000	
	Phase 3	2 diamond drill holes in Marsh Lake area to test NW extension of Zone	3,200 m	$300	960,000	
		2 wedges (including rig and crew time)	2	$20,000	40,000	
		2 wedged holes from initial pilot holes	1,200 m	$500	600,000	
		Project Management and Geological	4,400 m	$30	132,000	
		Assaying Samples	500	$32	16,000	
		Room & Board	4,400	$10	44,000	
		Consumables & Miscellaneous Costs	4,400	$5	22,000	
		Contingency on Subtotal	5% of costs above ($1,836,000)		94,000	
		Subtotal for Phase 3 Drilling			$ 1,900,000	
			Total for Banana Lake Zone Drilling			$ 7,600,000
			GRAND TOTALFOR TEASDALE LAKE AND BANANA LAKE ZONES			$ 14,600,000

* *all support costs are factored on a per metre basis*

Table 39
Appia Energy Corp. Budget for Supporting Work and Studies, 2011-12

Item	Description	Unit Cost
Mineral Economics Study	Review of uranium market, reactor construction plans, supply-demand criteria & delivery schedules.	$60,000
Public Dialogue	Proactive dialogue and consensus building with Elliot Lake and First Nations community leaders	$60,000
Drill Hole Surveying	Additional locating and surveying of historical holes; Construction of GIS	$60,000
Data Acquisition	Search for complete historical information through library/university archives & private sources.	$30,000
Metallurgical Study	Metallurgical recovery analysis.	$207,000
Preliminary Assessment Study	Updated mineral resource estimate and economic evaluation of the Teasdale Deposit; mining/processing options.	$169,000
	Sub-Total	$586,000
Contingency	~15% of costs above	$84,000
	Total of Incidentals for Project Support	$670,000

In respect to drilling the Teasdale Lake Zone, WGM has previously recommended that Appia's exploration program be staged so that, over time, risk can be minimized by building slowly from the established facts concerning the historical work. A program of 31 vertical diamond drill holes is proposed on approximate 200 m spacings to enable better delineation of the inferred uranium resources and up-grading of these resources to the indicated category.[26] Twelve of the proposed holes are located on Quirke Lake, requiring the building of ice platforms as soon as the winter ice thickens to the point where it will can support a work crew. A budget of $120,000 was provided for the labour involved in flooding the ice. The locations of certain holes may be amended or eliminated as the drilling progresses, however, the overall amount of drilling should not vary significantly from that proposed herein. The proposed new Teasdale drill hole location data are given in Appendix 1. With further on-site evaluations of proposed drill hole locations, as shown in the Teasdale figure, it may be possible to replace some of the off-shore drill holes with obliquely angled holes from the shoreline. Although such drill holes would be longer than they might otherwise be if drilling from the optimum location, this approach would reduce the need for winter drilling and the costs associated with ice-platform construction.

[26] It must also be noted that the confidence level of Mineral Resources, as defined under NI 43-101, is also dependent on market forces, especially the Term Market. WGM does not view Spot Market activity as relevant in the context of the Appia Project.

On-going exploration should be directed at developing a separate budget for confirmation of uranium resources in other mineralized zones such as the Canuc Zone and in the Gemico Zones. In WGM's view, an initial budget for 2,000 to 3,000 m of drilling costing approximately $750,000 to $1.5 million would be appropriate for such purposes. Future drilling on Gemico Block 3 will require approval from the federal Nuclear Safety Commission to allow Denison to grant Appia the right to drill. As the area of interest is located near a major road, and is not in an area of tailings or other former mine infrastructure, WGM foresees no reason why such approval would be denied.

Project objectives must also be re-examined periodically in the context of uranium commodity markets. In this respect, we believe that the project should be actively managed, and that a strong overall project manager with considerable exploration experience will be required to control the various elements of this project. It will require a dedicated team at the management level to ensure that local circumstances, for example public pressure, does not derail project operations. The project is ambitious and it requires favourable uranium market conditions, but it is prefaced on what WGM believes is an excellent opportunity to revitalize an area that has been long overlooked. If the outcome of the initial drilling in the Banana Lake area is positive, programs of in-fill and continuing step-out drilling will be required to up-grade the confidence level of the resources and to enlarge the resources.

23. SIGNATURE PAGE

This report titled "*A Technical Review of the Appia Energy Corp. Rare Earth Metal - Uranium Property, Elliot Lake District, North-Central Ontario, Canada*" for Appia Energy Corp. and dated 18 July, 2011 was prepared and signed by the following authors:

Dated effective as of 18 July, 2011.

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Watts, Griffis and McOuat Ltd.

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CERTIFICATE

To Accompany the Report Entitled
"A Technical Review of the Appia Energy Corp. Rare Earth Metal - Uranium Property,
Elliot Lake District, North-Central Ontario, Canada"
for Appia Energy Corp.
dated 18 July, 2011

I, Albert W. Workman, do hereby certify that:

1. I reside at 2285 Lakeshore Blvd. West, Suite 2413, Toronto, Ontario, Canada, M8V 3X9.

2. I graduated from Brock University in St. Catharines, Ontario, Canada, in 1975 with an Honours B.Sc. in Geological Sciences and I have practiced my profession continuously since then for a total of 36 years in Canada and internationally. I worked exclusively in uranium exploration during 1975 in the Collins Bay area Saskatchewan, and again exclusively in uranium on projects throughout Canada during 1977-1982. Since 1998, I have provided QP services on a variety of uranium projects in Saskatchewan, Ontario and Quebec as well as the United States, Madagascar, Tanzania and Guyana.

3. I am a Practicing Member of the Association of Professional Geoscientists of Ontario (Member #0170). I am also a Fellow of the Australian Institute of Mining and Metallurgy (AusIMM) as well as a Member of the Society of Economic Geologists (SEG), the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), and the Prospectors and Developers Association of Canada (PDAC).

4. I am a Senior Geologist and Vice-President with Watts, Griffis and McOuat Limited, a firm of consulting geologists and engineers, which has been authorized to practice professional engineering by the Professional Engineers Ontario since 1969.

5. 1 have read the definition of "Qualified Person" in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, past relevant work experience and affiliation with a professional association, that I fulfill the requirements to be a Qualified Person for the purposes of NI 43-101.

6. I visited the Elliot Lake properties of Appia Energy Corp. on 15-16 May, 2007, during which I reviewed data and visited former exploration drilling sites. I visited the Ministry of Northern Development and Mines as well as the Ministry of the Environment, and met with local government officials concerning policy issues. I returned to the project site on 3-4 June, 2008 during which I confirmed the most recent diamond drilling program and collected independent check samples for the purpose of auditing Appia's reported analytical data.

7. I am responsible for all sections of this report, and jointly responsible for the Mineral Resource estimates in Section 17 with co-author Kurt Breede. I am a co-author of the previous WGM reports concerning the Appia property described herein and am jointly responsible with the coauthor for the resource estimates contained therein. I am also responsible for co-ordinating the in-put of other QPs who were used as sources of information for this technical report relating to the Appia Energy Corp. property in the Elliot Lake area of north-central Ontario, Canada.

8. Since 2008, I have acted in the capacity of Qualified Person in respect to the exploration property discussed in this report and authored or co-authored several previous reports on this property.

9. I am independent of the issuer applying all of the tests in Section 1.5 of the Canadian Securities Regulation NI 43-101.

    a. Neither I, nor any affiliated entity of mine, is at present under or expects to be under an agreement, arrangement or understanding to become, an insider, associate, affiliated entity or employee of Appia Energy Corp., or any associated or affiliated entities.

    b. Neither I nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive any interest in the properties or securities of Appia Energy Corp., or any associated or affiliated companies.

    c. Neither I nor any affiliated entity of mine, have earned the majority of our income during the preceding three years from Appia Energy Corp., or any associated or affiliated companies.

10. I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and I have prepared the report in conformity with generally accepted Canadian mining industry practices.

11. As of the effective date of this technical report, and to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Al Workman, P.Geo.
7 November, 2012

CERTIFICATE

To Accompany the Report Entitled
"A Technical Review of the Appia Energy Corp. Rare Earth Metal - Uranium Property,
Elliot Lake District, North-Central Ontario, Canada"
for Appia Energy Corp.
dated 18 July, 2011

I, Kurt Breede, do hereby certify that:

2. I reside at 76 Woodrow Avenue, Toronto, Ontario, M4C 1G7.

3. I graduated from the University of Toronto, Toronto, Ontario in 1996 with a B.A.Sc. in Geological and Mineral Engineering, and have been practicing my profession since 1996.

4. I am a Professional Engineer licensed by Professional Engineers Ontario (Registration Number 90501859) and The Association of Professional Engineers and Geoscientists of Saskatchewan (Registration Number 17014).

5. I am a Vice-President, Marketing and Technical Services with Watts, Griffis and McOuat Limited, a firm of consulting geologists and engineers, which has been authorized to practice professional engineering by Professional Engineers Ontario since 1969, and professional geoscience by the Association of Professional Geoscientists of Ontario.

6. I have read the definition of "Qualified Person" in National Instrument 43-101 ("NI 43-101") and certify that I am a Qualified Person for the purposes of NI 43-101 by virtue of my education and having experience with regard to a variety of mineral deposit types, with Mineral Reserve and Mineral Resource estimation parameters and procedures and with those involved in the preparation of technical studies.

7. I did not visit the Property.

8. I am jointly responsible for the current uranium-rare earth Mineral Resource estimate for the Teasdale Zone and the Mineral Resource estimate for the Banana Lake Zone in Section 17 with co-author Al Workman. I have had no involvement with the auditing of the Sprague historical estimate, or the 2008 uranium Mineral Resource estimate.

9. I am independent of the issuer applying all of the tests in Section 1.5 of the Canadian Securities Regulation NI 43-101.

   a. Neither I, nor any affiliated entity of mine, is at present under or expects to be under an agreement, arrangement or understanding to become, an insider, associate, affiliated entity or employee of Appia Energy Corp., or any associated or affiliated entities.

   b. Neither I nor any affiliated entity of mine, own, directly or indirectly, nor expect to receive any interest in the properties or securities of Appia Energy Corp., or any associated or affiliated companies.

   c. Neither I nor any affiliated entity of mine, have earned the majority of our income during the preceding three years from Appia Energy Corp., or any associated or affiliated companies.

10. I have read NI 43-101 and Form 43-101F1 and have prepared the technical report in compliance with NI 43-101 and Form 43-101F1; and I have prepared the report in conformity with generally accepted Canadian mining industry practices.

11. As of the effective date of this technical report, and to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Kurt Breede, P.Eng.
7 November, 2012

APPENDIX 1

LOCATION DATA FOR PROPOSED NEW APPIA DRILL HOLES ON THE TEASDALE LAKE ZONE

WGM Proposal for Appia Energy Drilling - Teasdale Lake Zone, 2011-2012

DDH #	UTM Location		Elevation	Dip	Bearing	Length	Corrected Length (For Elev. Above Lake)
	Easting	Northing					
Q-11-7	383315	5148430	400	-85	015	610	645
Q-11-8	383550	5148430	425	-85	015	600	660
Q-11-9	383800	5148430	405	-85	020	590	630
Q-11-10	383812	5148770	345	-85	025	450	435
Q-11-11	383560	5148625	400	-85	020	585	615
Q-11-12	383305	5148630	370	-85	020	590	595
Q-11-13	383440	5148830	370	-85	020	500	510
Q-11-14	383190	5148830	370	-85	020	500	510
Q-11-15	383170	5149030	360	-85	025	450	450
Q-11-16	383440	5149475	345	-85	030	350	340
Q-11-17	383670	5149300	345	wedge off C-18		100	100
Q-11-18	383775	5149180	345	-85	030	375	365
Q-11-19	384025	5149180	390	-85	030	375	410
Q-11-20	384350	5148530	345	-85	030	500	485
Q-11-21	383010	5149600	340	-85	030	350	335
Q-11-22	383920	5149030	345	-85	030	375	365
Q-11-23	382910	5149400	340	-85	030	375	360
Q-11-24	384410	5148945	345	-85	025	400	390
Q-11-25	382920	5149200	340	-85	025	400	385
Q-11-26	384620	5148820	345	wedge off C-13		100	100
Q-11-27	382925	5149000	340	-85	025	450	435
Q-11-28	382800	5148800	340	-85	020	525	505
Q-11-29	383000	5148800	340	-85	020	525	505
Q-11-30	384075	5148590	345	-85	025	480	465
Q-11-31	382810	5148600	340	-85	020	575	550
Q-11-32	382810	5148400	340	-85	015	650	625
Q-11-33	382590	5148135	345	wedge off R-3		100	100
Q-11-34	383150	5149230	380	-85	030	375	400
Q-11-35	383060	5148640	340	-85	020	585	565
Q-11-36	383390	5149035	350	-85	025	430	425
Q-11-37	383580	5149100	340	-85	025	400	380
Q-11-38	384620	5148370	345	-85	020	500	485
Q-11-39	384150	5149360	345	-85	030	300	295
Q-11-40	384465	5149365	345	-85	030	300	295
Q-11-41	384970	5149175	345	-85	030	300	290
Q-11-42	384115	4148975	345	wedge off C-14		100	100
Q-11-43	383560	5148965	345	wedge off C-19		100	100
Q-11-44	383090	5148960	345	wedge off C-17		100	100
Q-11-45	383060	5148110	345	wedge off R-4		100	100
		Number of Holes =	39		TOTAL METRES =		15,405

APPENDIX 2

Excerpt from Report Entitled
"A Technical Review of The Appia Energy Corp. Elliot Lake Uranium Properties,
Elliot Lake District, North-Western Ontario, Canada"
by Workman and Vasak,
Dated 11 September, 2008

17. MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

17.1 BACKGROUND

No information was available to WGM concerning the estimation of mineral resources and mineral reserves in the Elliot Lake mines. WGM was able to locate a document regarding practices used at the Agnew Lake Mine where "geological reserves" were calculated using a cut-off grade of 0.75 lbs U_3O_8 per ton (0.38 kg/t). "Proven" reserves were restricted to reserves that occurred within 200 feet (61 m) of underground workings and were developed on two or more sides (Agnew Lake Mines, 1980). "Probable" reserves were uranium-bearing beds that occurred within 200 feet (61 m) of workings, but were only developed on one side, or alternatively, were uranium-bearing beds that had drill hole intersections closer that 400 feet (122 m) apart. "Inferred" reserves were defined as uranium-bearing beds that had drill hole intersections greater than 400 feet (122 m) apart.

WGM believes that similar practices were used for the Elliot Lake deposits. The reliance on data from widely spaced drill holes was common practice at the time, and supported by the uniformity of the ore and its stratiform character.

Although WGM has not seen specific mention of a dilution grade used for the conversion from geological reserves to minable reserves, a document by Agnew Lake Mines Ltd. concerning the methods used in the reserve calculation, dated 18 January, 1980, indicates that the practice at the Agnew Lake Mine was to use a zero grade for dilution purposes (Agnew Lake Mines, 1980). We are uncertain whether this was the practice in the Elliot Lake mines as the ore zones at Elliot Lake had shoulders of lower grading uranium-bearing rock.

17.2 CURRENT RESOURCE ESTIMATES

17.2.1 Introduction

The procedures used and the results obtained in the resource estimate are described herein. The estimates were based on data provided by Appia Energy Corp. for its mineral exploration property located in the Elliot Lake area, and specifically on data from recent drilling south of Quirke Lake and to the west of Teasdale Lake and also near Banana

Lake. Significant mineralization of a historical nature occurs in the two areas drill-tested by Appia. This drilling has enabled Appia to confirm the results of the earlier drilling, and it has allowed WGM to audit one of the original estimates as previously discussed in this report. The recent work has also allowed WGM to model the existing and recant data to produce a resource estimate that complies with NI 43-101. This modeling has been facilitated by the remarkable continuity that data and historical evidence shows exists in paleo-placer uranium deposits in the Elliot lake basin.

The resource estimates were carried out by Mr. Jose Saaverdra Rosas of Mirarco Mining Innovation and an associate of WGM. The work was carried out under the supervision of Al Workman, the principal author of this report.

17.2.2 Information Provided for the Estimate

Drill Hole Data

The initial data provided for the resource estimate consisted of drill hole information as a series of CSV files containing: Collar locations, down-holes surveys and assays. These CSV files were provided by Appia Energy Corp., had been processed to eliminate duplicates and to validate drill hole assay information. This set of files indicated that the 18 historical holes were vertical however historical drawings show that the holes were drilled at a “near vertical”. The holes naturally exhibit small deviations, but given the continuity of the mineralization, the length of the holes and the size of the blocks used in this study we do not believe that estimating the drill holes as being vertical will create any significant calculation/estimation errors.

The drill hole information was split into two categories: Historical and Appia or "new" holes. The Appia holes were drilled during a 2007-2008 sampling campaign. These new holes were drilled to confirm results from the historical holes.

Drill hole information was clustered in two areas: holes drilled south of the Quirke Lake and to the West of Teasdale Lake are referred to as the Teasdale holes and the holes located to the Southwest near Banana Lake are referred to as the Banana holes.

Extract from Workman and Vasak, 2008

There were six new Teasdale holes: Q-07-01, Q-07-02, Q-07-03, Q-08-04, Q-08-05 and Q-08-06; and, four new Banana holes: BL-07-01-W1, BL-07-01-W2, BL-08-02-W1 and BL-08-02-W2.

Sprague report

In addition to the drill hole information, Appia provided a copy of a report entitled "Report on Artisan Gold Inc. Ground in Buckles Township, Ontario". This un-dated report describes a resource calculation undertaken by D. Sprague, P.Eng. on an area described as the "area staked covers some former Panel Mine claims, Conecho Claims and claims held formerly by Roche Long Lac (North Rock Explorations)". A map included with the report shows the collar locations of the historical drill holes.

Sprague's report mentions that the resource calculations where performed using the same methodology as used by the staff of the Panel Mine (located to the west of the property). The report does not however explicitly detail what the methodology was nor does it specify the value that was used for the specific gravity in converting volumes to tonnage.

Sprague's report provided a mineable resource based on three categories: "Drill Indicated", "Mine Indicated" and "Possible". A summary table in the report provides the following values derived from the resource estimate:

Average Grade:	1.206 lbs U_3O_8/ton
Tons:	17,458,200
Contained Uranium:	20,787,200 lbs U_3O_8

The foregoing resource estimate, as previously mentioned in this report, was carried out using assumptions and procedures that may not conform to current CIM best practices standards. As a result of WGM inability to specify what procedures and assumptions were used, the estimate must be treated as a historical record that does not comply with NI 43-101 and which should not be used as a basis for investment decisions, notwithstanding WGM's favourable audit (described in Section 9.4 of this report).

It should be noted that no drill hole information for the Panel Mine and the possible resource remaining therein was available to the authors as of the date of this report.

Extract from Workman and Vasak, 2008

After reviewing a large scale map provided with Sprague's report, WGM notes that his resource calculation used a maximum area of influence of approximately 1,000,000 square feet around the historical drill holes. However, drill holes located near the northern boundary of the property were assigned a smaller area of influence. There is no information regarding the way Sprague determined the areas of influence for each drill hole and it is assumed that a detailed knowledge of the local surface and mine geology and then current "best practices" was used to define these areas of influence. As mentioned, the report does not provide any details regarding the selection of a specific gravity value to be used in the resource calculation

Gemico Property Map

The area of influence for the Banana holes was based on an outline of uraniferous conglomerate provided by Appia Energy Corp. and referred to as the Rio Algom Ltd. Gemico Properties, Elliot Lake Area map. The map did not provide a scale bar, and thus we relied on Google Earth to provide a number of distance measurements to then estimate the area of the uraniferous conglomerate. Based on these calculations, the area of influence for the four Banana holes was estimated to be 5,760,00 m^2 or approximately 62,000,000 ft^2.

Other information

Appia provided a uniform specific gravity value of 2.85 tonnes per cubic meter based on preliminary density measurements made at the Actlabs laboratory at Ancaster, Ontario. Although the population is only 14 samples, the data produced by measuring the density using two different means show a trend line passing through approximately 2.85 at a grade of approximately 1 lb U_3O_8 per ton. We note that this figure is 5.6% higher than the 2.70 specific gravity recently used by Scott Wilson Roscoe Postle Associates for the recent Pele Mountain Resources estimate.

The following section describes the procedures used for the resource estimation, provides a discussion of the results of the resource calculation and provides conclusions based on the information obtained.

17.2.3 Methods and Procedures

The initial intent of the resource estimate practitioners was to perform variography based on the drill holes provided, and to use kriging and geostatistical conditional simulation to calculate a resource. Unfortunately, the information provided involved too few drill hole samples to generate meaningful geostatistical data. Given the lack of variography we decided to use a nearest neighbor approach for estimating the resource. The viability of this approach is supported by the good horizontal continuity of the deposit (historical information and experience provided by Appia), and the authors' review of the Pele Mountain resource estimation report (Cochrane and Roscoe, 2007). As mentioned previously, the historical estimate assigned an area of influence to each hole where differences in the intersections between different areas (or blocks in the terminology of the report) accounted for the nature of the continuity of the deposit in the horizontal direction.

Assay compositing was carried out by WGM using a one metre interval along the drill holes. Composite lengths of 2-metres and 5-meters were considered, and the authors concluded that, based on the length of the drill hole intersections, the best alternative was to use 1-meter composites. Longer compositing lengths would affect the tails of the grade distributions.

Based on Sprague's report, a representative area of influence was measured using the map provided and the maximum area of influence was determined to be 1,000,000 square feet. However, this area of influence was actually based a square centered on the projection to surface of the grade intercept along the drill holes. A calibration procedure was performed to determine the radius of the search ellipsoid that would be appropriate for the deposit. In WGM's audit of the historical estimate (see foregoing section), it was determined that a radius of 89 m and a cut-off grade of 0.65 lbs U_3O_8/ton provided results very close to the Sprague estimate. Based on WGM's experience, we believe that a search radius of 89 m is excessively conservative for a stratiform deposit such as those in the Blind River area. Mining practice, including drilling for stope development, shows that a spacing of several hundred metres can be used to predict grade.

WGM selected a cut-off grade of 0.60 lbs U_3O_8 per ton as a reasonable value based on its belief, enunciated elsewhere in this report, that future uranium prices will at least match the inflation-adjusted values in the past. We believe that a lead time of at least 5 years must be allowed for additional exploration, mine planning, a feasibility study, permitting, site preparation, construction and mine development. There is considerable evidence that the World is on the cusp of another major round of reactor construction which will markedly increase uranium demand. Unlike in the past, where uranium production kept well ahead of demand, this new construction comes at a time of depleted stockpiles and a scarcity of significant new discoveries. The 0.60 lbs U_3O_8 per ton cut-off represents \$60 ore at a \$100/lbs U_3O_8 commodity price. WGM believes that five years hence, the uranium price will be substantially higher as reactors now under construction are looking for long-term assured sources of supply.

In light of the geological nature of the deposit, WGM used the nearest neighbor approach with a search ellipsoid defined as omnidirectional on a -19^{o} inclined plane to match the average dip of the host rocks (clockwise rotation around the X-axis) and having a radius of 140 m to outline Indicated Resources. A minimum thickness (height) of 5 m was used. For comparative purposes, this radius is well within the 200 m hole spacing recommended by the consultants working on the Pele Mountain Resources Elliot Lake project for up-grading Inferred Resources to Indicated Resources pursuant to a NI 43-101 compliant preliminary feasibility study (Cochrane, Hwozdyk and Hayden, 2007). The Inferred Resources were calculated with a similarly defined search ellipsoid with a radius of 280 m and a minimum thickness of 5 m.

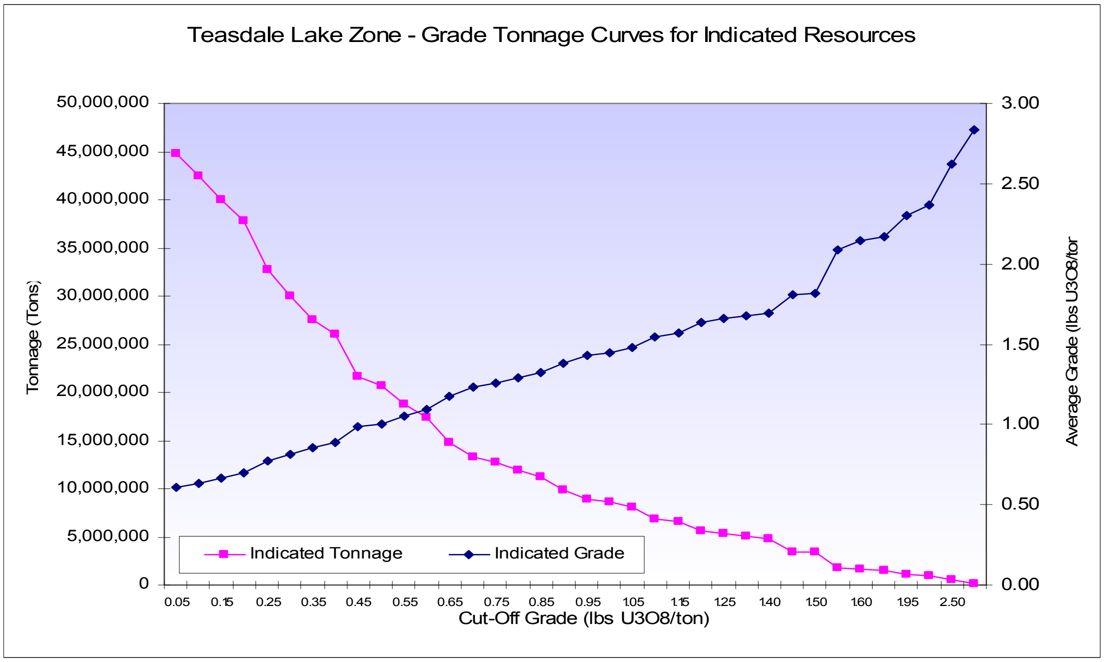
17.2.4 Resource Estimation Results for the Teasdale Lake Zone

The following tables and graphs present the results of the nearest neighbor resource calculations. Table 14 provides the resource classification based on different cut-off grades for the Teasdale deposit. The data show that using a cut-off of 0.60 lbs U_3O_8/ton cut-off results in an Indicated Mineral Resource of 17.4 million tons (15.8 Mt) with an average grade of 1.10 lbs U_3O_8/ton (0.55 kg U_3O_8/t) and an Inferred Mineral Resource of 48 million tons (43.5 Mt) at the same grade. At this cut-off grade, the uranium oxide contained in Indicated and Inferred resources is 19.0 Mlbs and 52.7 Mlbs, respectively. Figure 11 shows the Teasdale deposit's grade-tonnage curves for each resource class at varying cut-off values. Figure 12 shows the location of the Teasdale resource blocks.

A 3-D view of the resource blocks is presented in show the areas of influence for a 140 m search radius and for a 280 m radius.

Table 14
Mineral Resources Classification for the Teasdale Lake Zone Using Various Cut-Off Grades

Cut-Off Grade (lbs U_3O_8/ton)	Indicated Resources				Inferred Resources			
	Volume (m^3)	Tonnage (tons)	Average Grade (lbs U_3O_8/ton)	Contained Metal (lbs U_3O_8)	Volume (m^3)	Tonnage (tons)	Average Grade (lbs U_3O_8/ton)	Contained Metal (lbs U_3O_8)
0.05	14,272,000	44,836,680	0.60	27,124,347	40,113,600	126,020,224	0.60	75,674,221
0.10	13,534,400	42,519,448	0.63	26,961,804	37,963,200	119,264,563	0.63	75,192,631
0.15	12,739,200	40,021,261	0.67	26,666,993	35,696,000	112,141,965	0.66	74,352,239
0.20	12,025,600	37,779,427	0.70	26,265,013	33,640,000	105,682,869	0.69	73,188,829
0.25	10,408,000	32,697,601	0.77	25,175,845	29,121,600	91,487,938	0.77	70,146,950
0.30	9,564,800	30,048,618	0.81	24,454,020	26,806,400	84,214,544	0.81	68,162,541
0.35	8,771,200	27,555,457	0.86	23,626,992	24,537,600	77,086,919	0.85	65,799,761
0.40	8,302,400	26,082,683	0.88	23,067,104	23,233,600	72,990,294	0.88	64,244,598
0.45	6,881,600	21,619,121	0.98	21,258,116	19,104,000	60,016,811	0.98	58,982,275
0.50	6,600,000	20,734,451	1.01	20,838,715	18,318,400	57,548,783	1.00	57,814,936
0.55	5,984,000	18,799,236	1.06	19,844,823	16,524,800	51,914,039	1.06	54,924,960
0.60	**5,528,000**	**17,366,674**	**1.10**	**19,034,641**	**15,276,800**	**47,993,343**	**1.10**	**52,704,616**
0.65	4,729,600	14,858,433	1.18	17,492,848	13,094,400	41,137,151	1.18	48,491,418
0.70	4,225,600	13,275,075	1.24	16,420,099	11,672,000	36,668,563	1.24	45,467,527
0.75	4,060,800	12,757,342	1.26	16,047,652	11,225,600	35,266,160	1.26	44,458,808
0.80	3,782,400	11,882,725	1.29	15,371,400	10,441,600	32,803,158	1.30	42,553,637
0.85	3,555,200	11,168,958	1.32	14,794,567	9,803,200	30,797,571	1.33	40,935,635
0.90	3,148,800	9,892,218	1.38	13,686,199	8,619,200	27,077,937	1.39	37,705,681
0.95	2,838,400	8,917,071	1.43	12,774,029	7,737,600	24,308,316	1.44	35,114,967
1.00	2,764,800	8,685,850	1.44	12,548,444	7,496,000	23,549,310	1.46	34,372,592
1.05	2,553,600	8,022,348	1.48	11,884,668	6,910,400	21,709,599	1.50	32,532,085
1.10	2,200,000	6,911,484	1.55	10,697,149	6,054,400	19,020,403	1.56	29,654,162
1.15	2,084,800	6,549,573	1.57	10,285,692	5,744,000	18,045,256	1.58	28,545,509
1.20	1,804,800	5,669,930	1.63	9,255,100	5,099,200	16,019,563	1.63	26,172,143
1.25	1,681,600	5,282,887	1.66	8,778,212	4,812,800	15,119,813	1.66	25,064,593
1.30	1,625,600	5,106,958	1.67	8,553,570	4,648,000	14,602,080	1.67	24,403,506
1.40	1,531,200	4,810,393	1.70	8,160,899	4,388,800	13,787,782	1.69	23,325,047
1.45	1,107,200	3,478,361	1.81	6,285,203	3,126,400	9,821,847	1.81	17,740,872
1.50	1,070,400	3,362,751	1.82	6,114,818	3,020,800	9,490,095	1.82	17,251,942
1.55	569,600	1,789,446	2.09	3,739,770	1,544,000	4,850,605	2.11	10,244,908
1.60	513,600	1,613,517	2.14	3,460,084	1,364,800	4,287,633	2.18	9,349,915
1.80	486,400	1,528,066	2.17	3,319,299	1,312,000	4,121,758	2.20	9,076,627
1.95	358,400	1,125,944	2.31	2,595,597	971,200	3,051,106	2.34	7,149,769
2.00	300,800	944,988	2.37	2,236,421	822,400	2,583,638	2.41	6,221,897
2.50	176,000	552,919	2.62	1,447,521	532,800	1,673,836	2.62	4,391,247
2.80	49,600	155,823	2.83	441,215	160,000	502,653	2.83	1,423,274



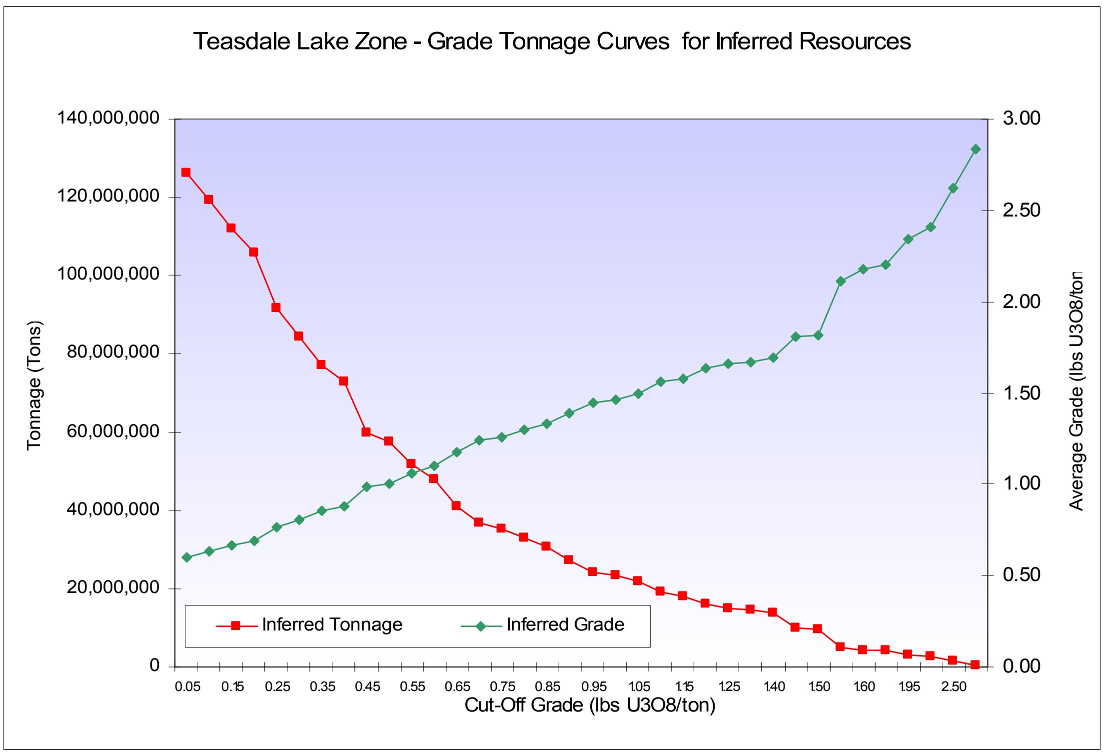


Figure 11: Grade-Tonnage Curves for Indicated and Inferred Resources in the Teasdale Lake Zone.

Watts, Griffis and McOuat

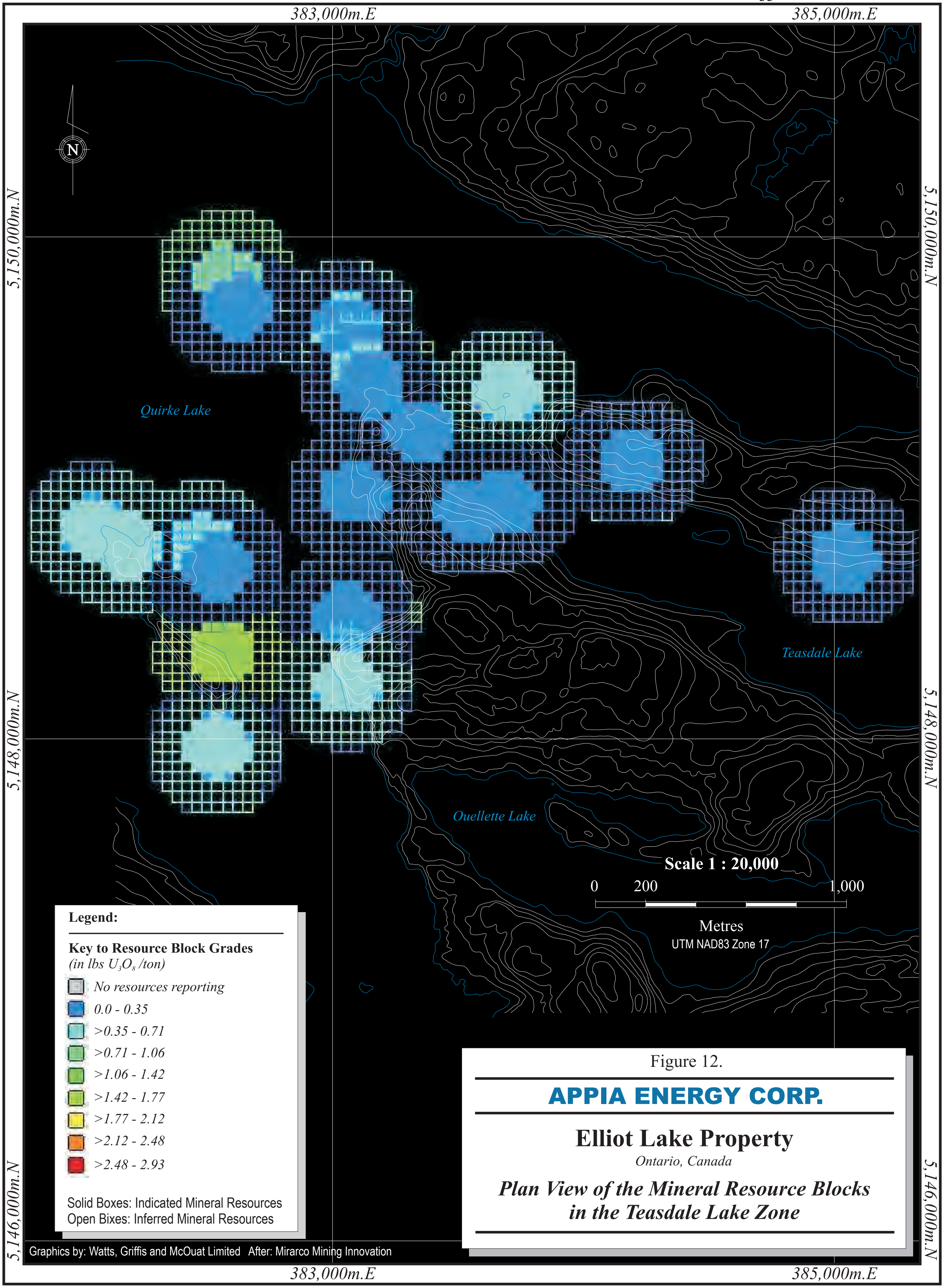


Figure 12.

APPIA ENERGY CORP.

Elliot Lake Property

Ontario, Canada

Plan View of the Mineral Resource Blocks in the Teasdale Lake Zone

WGM tested the potential for significant additional resources in the Teasdale Lake Zone by expanding the search ellipse to take in all areas located between the current drill holes. To do this, the search radius was extended outwards to 730 m. Using a 0.60 lbs U_3O_8/ton cut-off, it was shown that the potential exists in this zone for approximately 84 million tonnes of mineralization having an average grade of 0.82 lbs U_3O_8/ton. This mineralization is hypothetical and cannot be classified in accordance with NI 43-101. The potential for such large volumes of mineralization are consistent with the nature of the Elliot Lake uranium deposits. Although this test shows some decline in uranium grade, presence of such large amounts of uranium offers the potential for significant future production under favourable market conditions.

17.2.5 Resource Estimation Results for the Banana Lake Zone

An estimate was made of the mineral resources outlined in the Banana Lake Zone by using only those historical Kerr McGee diamond drill holes from which Appia wedged two new holes. The assay data used included the Kerr McGee intersections in the original (historical) hole as well as the two new intersections created by Appia in each hole. Appia was able to achieve new intersections that were sufficiently far from the original hole to not only confirm the original assays, but also far enough away to outline zones within which the resource blocks would be classified as Indicated Resources.

The two Kerr McGee holes, located 835 m apart according to GPS surveying, were interpreted by that company as indicating the presence of a thick zone of mineralization existing in the deeper part of the Elliot Lake Basin. As mentioned previously in this report, Kerr McGee used these holes and two others to estimate the presence of a considerable zone of mineralization in this area. For its resource estimate, WGM has used only the two Appia-tested holes for its resource estimate. Based on the thickness of the mineralization (approximately 40 m) and an assumption of formation continuity, WGM extrapolated between the holes to outline an area of Inferred Resources. WGM's search ellipse for Indicated Resources was 140 m and for Inferred Resources was 280 m. A minimum thicknesses of 5 m was used for the zone which was substantially less than the zone intersected in all holes. A 0.6 lb U_3O_8/ton cut-off was favoured, however WGM ran estimates at a wide range of cut-offs to generate a grade-tonnage matrix similar to that created for the Teasdale Lake Zone.

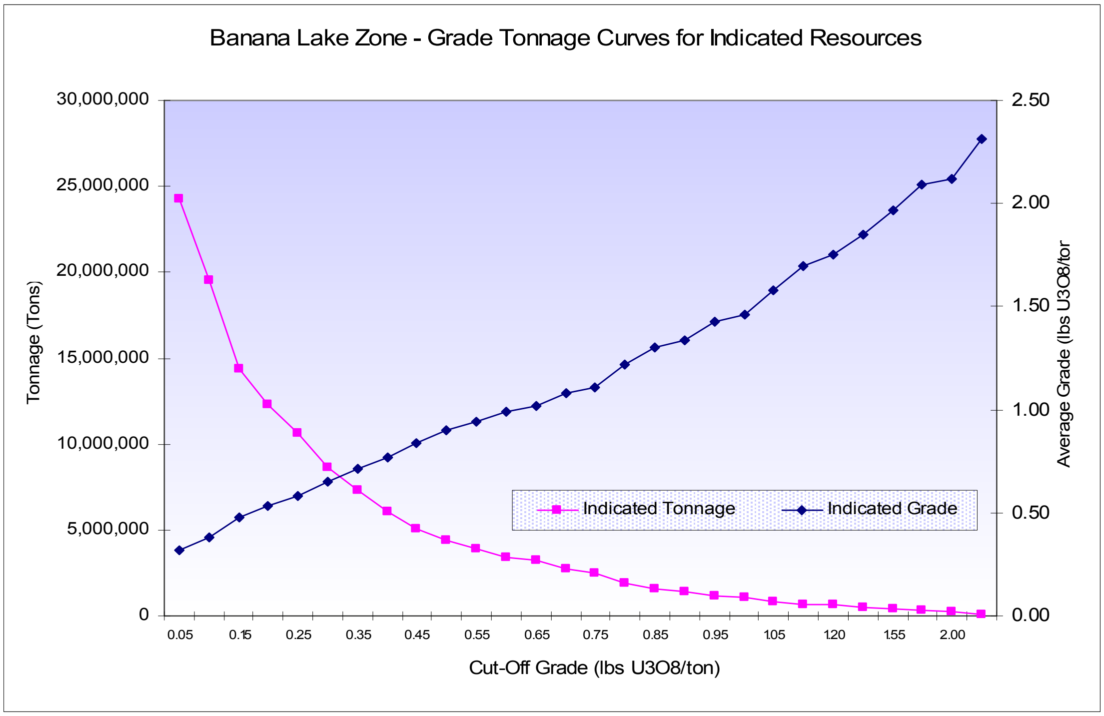
The data in Table 15 show that using a cut-off of 0.60 lbs U_3O_8/ton cut-off results in an Indicated Mineral Resource of 3.4 million tons (3.1 Mt) with an average grade of 1.0 lbs U_3O_8/ton (0.50 kg U_3O_8/t) and an Inferred Mineral Resource of 9.2 million tons (8.34 Mt) at the same grade. At this cut-off, the contained uranium oxide in the Indicated and Inferred Resources amounts to 3.4 Mlbs and 9.2 Mlbs, respectively. Figure 13 shows grade-tonnage curves for each Banana Lake Zone resource class at varying cut-off values. Resource blocks are shown in Figure 14.

It should be noted that the Appia drilling tested only a very small portion of the area formerly assigned to the Banana Lake Zone by Kerr McGee. WGM broadened its search ellipse to take in additional deep drill holes and to approximate the area outlined on the Rio Algom map. The search area for the digital model was increased to provide approximately 5,760,000 m^2 of coverage. The equivalent radius for the search ellipsoid was determined to be 1,117.5 m. With all other parameters and in-puts fixed at the same values as were used for the initial Banana Lake resource estimate and using a 0.60 lb U_3O_8/ton cut-off, it can be shown that the deep zone in the central part of the basin could contain as much as 166 million tons of mineralization having an average grade of 1 lb U_3O_8/ton. This mineralization is not well defined and cannot be classified as a mineral resource at this time as it lack sufficient drilling to allow WGM to classify it in compliance with NI 43-101. Clearly additional drilling is required to better outline this zone, however under favourable market conditions, the magnitude of this potential resource (approximately 170 Mlbs U_3O_8) could overcome the capital costs of developing a new mine in the central basin.

Table 15

Mineral Resources Classification for the Banana Lake Zone Using Various Cut-Off Grades

Cut-Off Grade (lbs U_3O_8/ton)	Indicated Resources				Inferred Resources			
	Volume (m^3)	Tonnage (tons)	Average Grade (lbs U_3O_8/ton)	Contained Metal (lbs U_3O_8)	Volume (m^3)	Tonnage (tons)	Average Grade (lbs U_3O_8/ton)	Contained Metal (lbs U_3O_8)
0.05	7,726,400	24,273,131	0.32	7,767,402	21,256,000	66,777,499	0.32	21,368,800
0.10	6,206,400	19,497,924	0.38	7,409,211	17,060,800	53,597,928	0.38	20,367,213
0.15	4,587,200	14,411,072	0.48	6,917,314	12,440,000	39,081,299	0.47	18,368,210
0.20	3,926,400	12,335,113	0.53	6,537,610	10,539,200	33,109,777	0.53	17,548,182
0.25	3,384,000	10,631,119	0.58	6,166,049	9,088,000	28,550,711	0.58	16,559,412
0.30	2,740,800	8,610,452	0.65	5,596,794	7,326,400	23,016,497	0.65	14,960,723
0.35	2,321,600	7,293,500	0.71	5,178,385	6,129,600	19,256,650	0.71	13,672,222
0.40	1,926,400	6,051,946	0.77	4,659,999	5,163,200	16,220,624	0.78	12,652,087
0.45	1,606,400	5,046,640	0.84	4,239,177	4,337,600	13,626,933	0.84	11,446,623
0.50	1,409,600	4,428,376	0.90	3,985,538	3,728,000	11,711,823	0.90	10,540,641
0.55	1,256,000	3,945,829	0.94	3,709,079	3,352,000	10,530,588	0.94	9,898,753
0.60	1,094,400	3,438,149	0.99	3,403,767	2,924,800	9,188,503	1.00	9,188,503
0.65	1,032,000	3,242,114	1.02	3,306,956	2,776,000	8,721,036	1.02	8,895,457
0.70	875,200	2,749,514	1.08	2,969,475	2,379,200	7,474,455	1.07	7,997,667
0.75	793,600	2,493,161	1.11	2,767,408	2,150,400	6,755,661	1.11	7,498,784
0.80	606,400	1,905,056	1.22	2,324,169	1,646,400	5,172,303	1.21	6,258,487
0.85	502,400	1,578,332	1.30	2,051,831	1,374,400	4,317,792	1.29	5,569,952
0.90	452,800	1,422,509	1.34	1,906,162	1,225,600	3,850,325	1.34	5,159,435
0.95	376,000	1,181,235	1.43	1,689,167	1,032,000	3,242,114	1.42	4,603,802
1.00	352,000	1,105,837	1.46	1,614,523	958,400	3,010,894	1.45	4,365,796
1.05	273,600	859,537	1.58	1,358,069	737,600	2,317,232	1.58	3,661,227
1.15	224,000	703,715	1.70	1,196,315	603,200	1,895,003	1.69	3,202,555
1.20	203,200	638,370	1.75	1,117,147	534,400	1,678,862	1.76	2,954,798
1.35	171,200	537,839	1.85	995,002	459,200	1,442,615	1.85	2,668,838
1.55	136,000	427,255	1.97	841,693	361,600	1,135,997	1.97	2,237,913
1.95	104,000	326,725	2.09	682,855	276,800	869,590	2.08	1,808,748
2.00	80,000	251,327	2.12	532,813	214,400	673,556	2.11	1,421,202
2.30	28,800	90,478	2.31	209,003	73,600	231,221	2.31	534,119



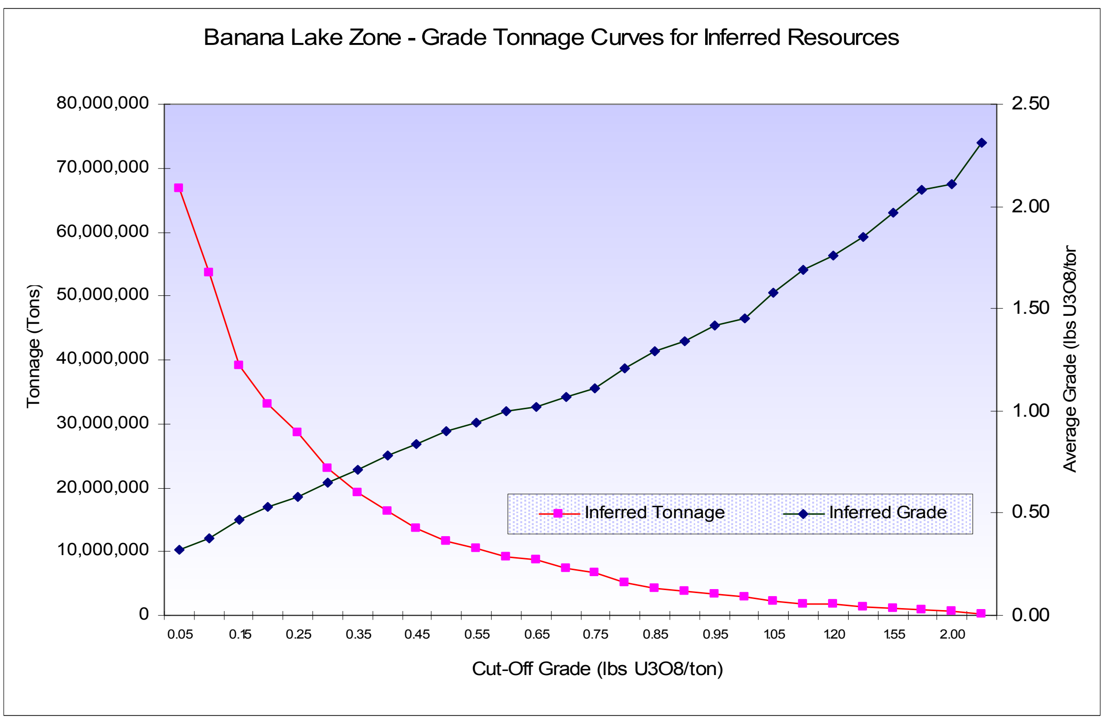


Figure 13: Grade-Tonnage Curves for Indicated and Inferred Resources in the Banana Lake Zone.

Figure 14: Block view of the mineral resource blocks in the Banana Lake Zone.