

Identification of Pb-Zn Sulphide Deposits in Pend Orielle, USA using Adrok's Atomic Dielectric Resonance Technology

The Pende Orielle mine is located in the Northern Cascades in Washington State, NW USA. The Metaline Zn-Pb district in which the Pende Orielle mine is located formed between the Late Proterozoic & the Devonian.

Introduction

- The main aim of the project is for Adrok to deploy their Atomic Dielectric Resonance (ADR) technology for a self-funded proof of concept survey in Pende Orielle, USA for Zinc and Lead sulphide deposits.
- Data was collected from 5 Virtual Boreholes (V-bores) above ground and from 1 underground V-bore in Pend Orielle mine (figure 1).

Key focus:

- Directly identify subsurface sulphide zones from ground level

Background & Geological Context

- The Metaline Zn-Pb district in which the Pende Orielle mine is located formed between the Late Proterozoic & the Devonian.
- The Metaline formation is a 915-1700m thick carbonate succession.
- The sedimentary units underwent extension during formation followed by metamorphism during the Nevadian Orogeny which allowed metallic rich fluids to accumulate within dolomitized limestones of the Metaline Formation through a series of North-East trending faults.

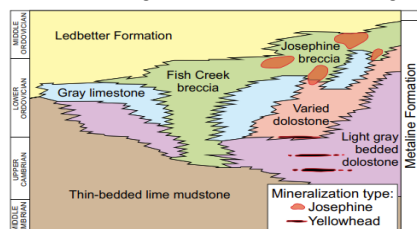


Figure 2: Paradis et al. (2020) Re-Os Pyrite Geochronology of the Yellowhead-type mineralisation, Pend Orielle Mine, Kootenay Arc Metaline district, Washington, USA Economic Geology

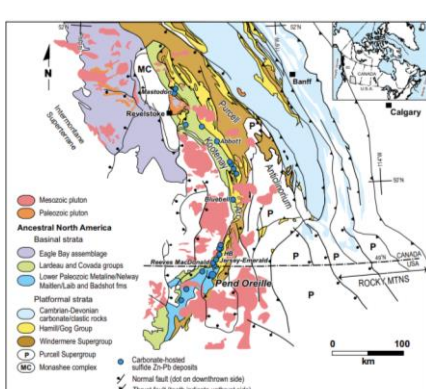
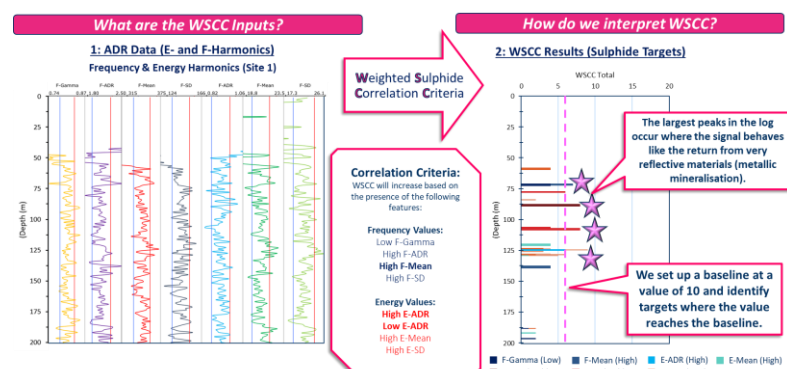
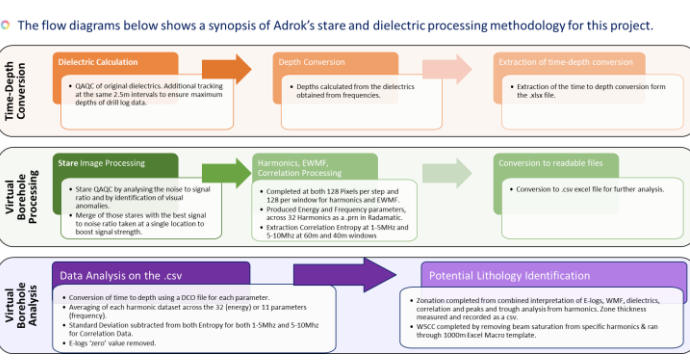


Figure 3: Pannalal et al. (2007) Paleomagnetic and mineral constraints on Zn-Pb ore genesis in the Pend Orielle Mine, Metaline district, Washington, USA

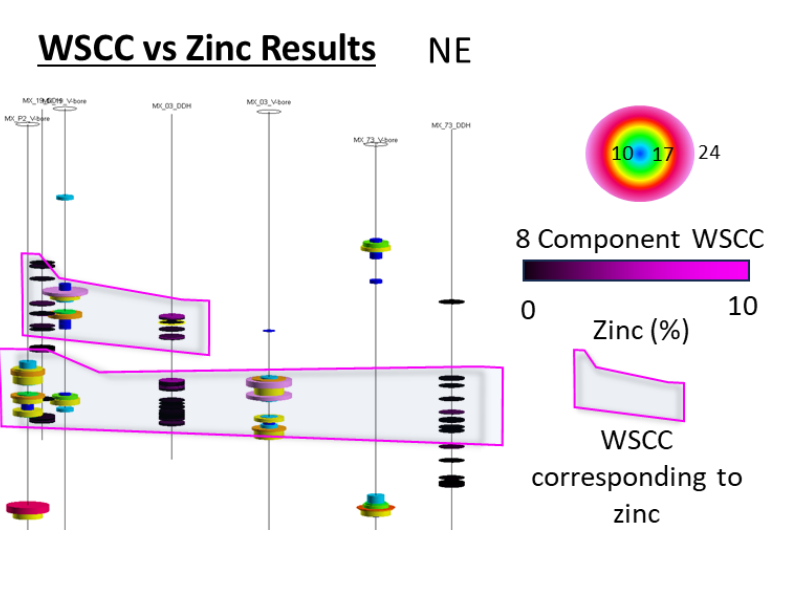
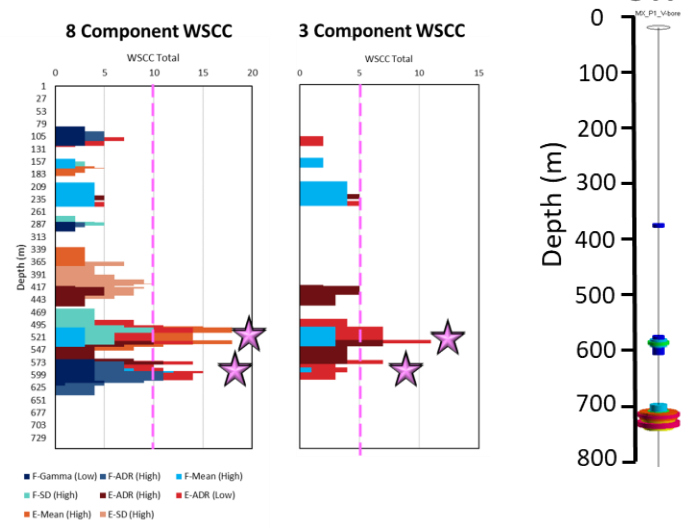
Age	Formation	Thickness (m)	Reference
Tertiary	Tiger Conglomerates	60	Dings and Whitebread (1965)
Silurian-Devonian	undifferentiated	450-500	
Ordovician	Ledbetter State	600-760	Dings and Whitebread (1965)
	Gray Limestone	200-450	
Metaline Formation	Bedded Dolostone	360-1200	Parks and Cannon (1943)
	Bedded Limestone	300-400	
Cambrian	Phyllite	1440	Parks and Cannon (1943)
	Reeves Limestone	60	
Precambrian	Gypsey Quartzite	1615-2150	Parks and Cannon (1943)
	Monk Formation	1160	
	Leola Volcanics	1525	
	Windermere Supergroup	1525	
	Priest River Group	+1000	

Methods



Results

Results MX03 WSCC

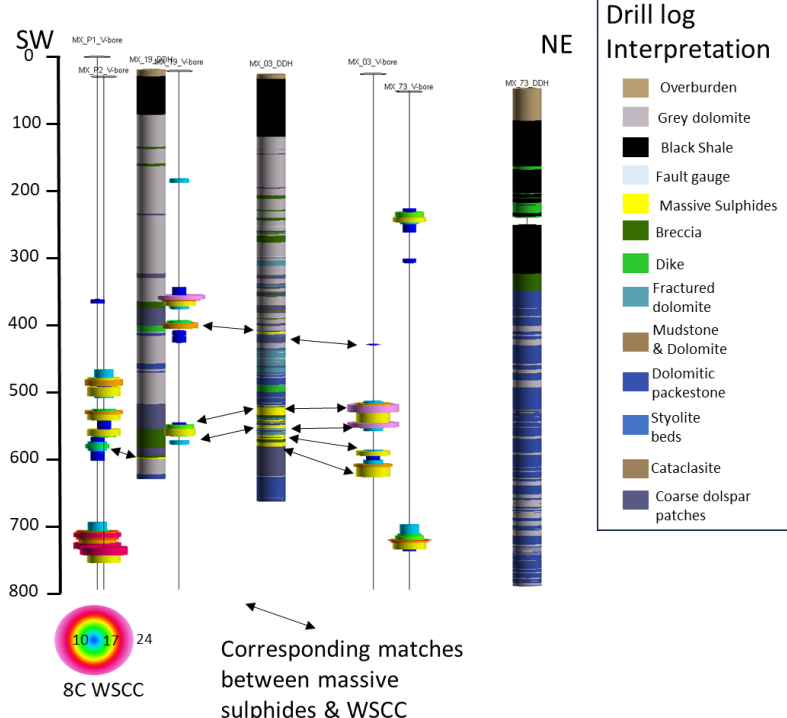


The WSCC results are compared with the drill log results in order to see if the highest values matches with the known sulphides.

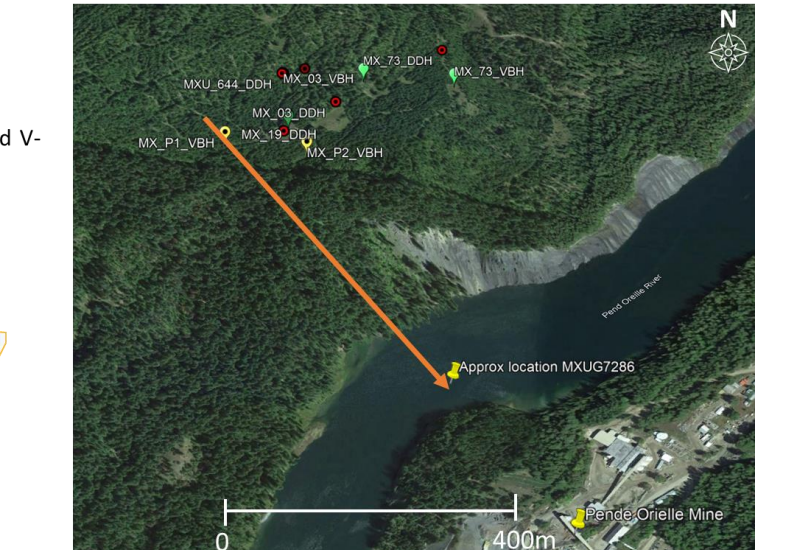
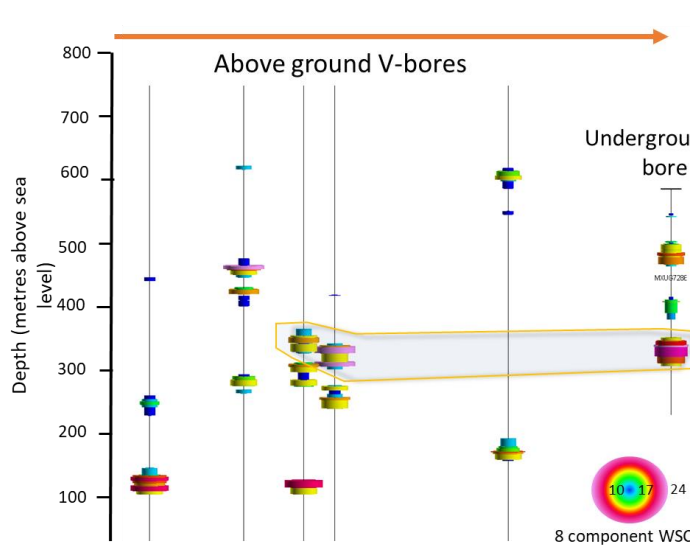
At MX03 the highest WSCC values clearly correspond to the massive sulphides between 500m-550m. A similar trend is noted in the blind V-bore MXP1. The massive sulphide at 400m in MX03 is noted in both MX03 & MX19 V-bores.

No sulphides are identified in the drill results in MX73 & the WSCC results show lower values than the other training results. The WSCC values either correspond to the basaltic dike at 200m or peaks in the corresponding WSCC results in MXP1 & MXP2.

The WSCC clearly identifies the areas where sulphides are present.



Overground v underground



A comparison has been made to see how the downhole WSCC results compare with the WSCC from underground V-bore (see Project 00269). We do not know the exact scan location of this underground V-bore. However, we do know the V-bore was scanned from the river allowing us to approximate this location. The results show the highest underground WSCC values correspond to some of the highest WSCC results validated in this study. **This is an excellent result.**