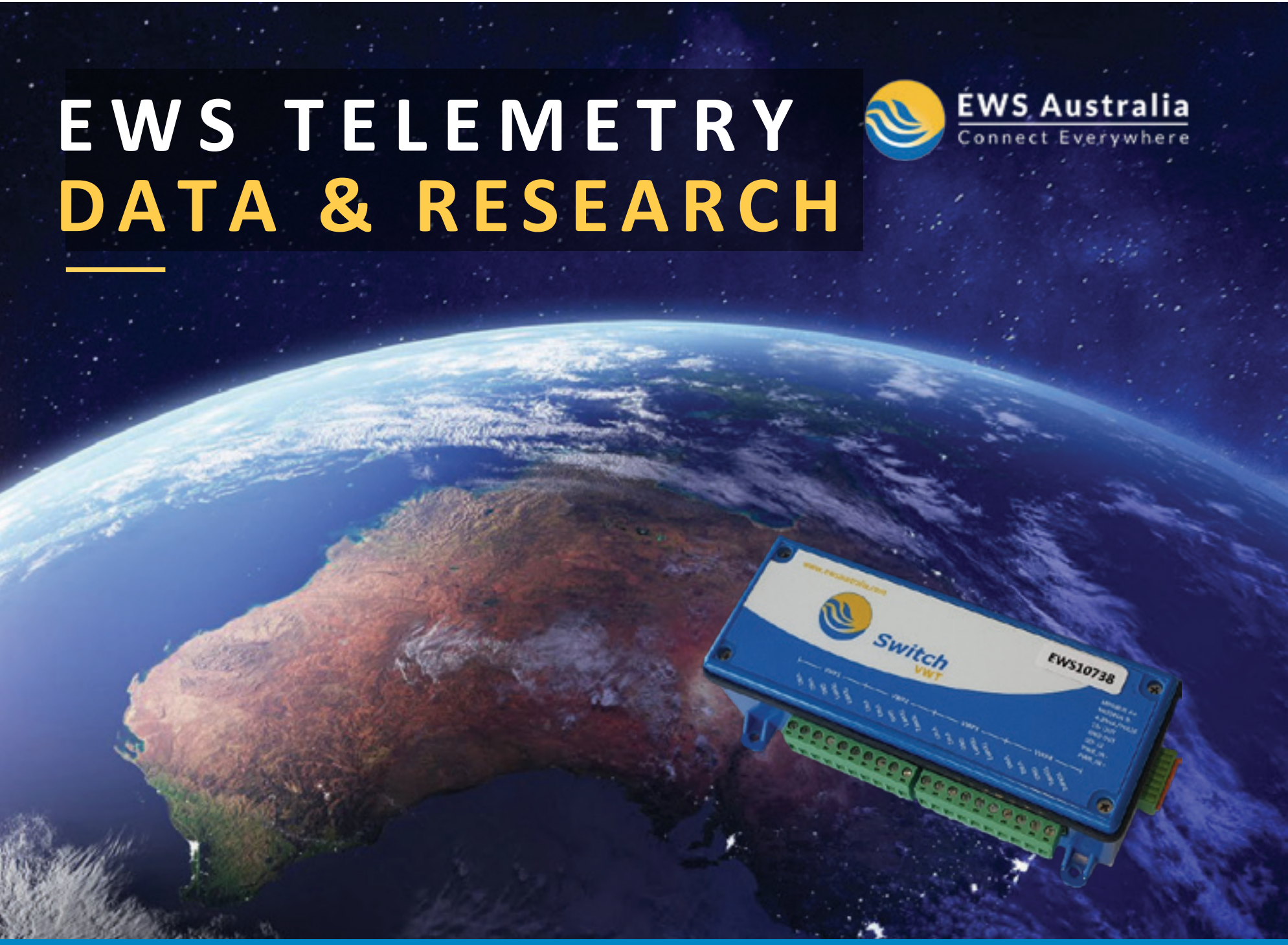
EWS TELEMETRY
DATA & RESEARCH

EWS Australia
Connect Everywhere



WHO IS EWS?

Connect everywhere, data to desktop anytime.

- Industry leading and innovative **IoT telemetry** manufacturer
- Providing **low cost** Satellite and Cellular IoT products and services, delivering the power to **measure and transmit** environmental, hydrometric and geotechnical data
- **Simple** to install, train and use
- **Intuitive secure data portal** to view and manage data from field to your desktop
- **Push data** to any existing database
- **On-time**, high **quality** and **frequent** data
- **Save** significant hours in the field and **reducing exposure** to site risks
- **Deal direct** = fast response and better support

EWS
PRODUCTS & SERVICES

Advanced range of sophisticated multi comm IOT transmitters

Australian designed, manufactured and local supported products

Equipment manufacturing process is certified by ISO 9001:2015 QMS systems*

Products Certified by Iridium for use on their Satellite constellation

EWS products have an exclusive licence to activate plans on the Iridium constellation

EWS data portal has been certified by multiple large mining companies Cyber security groups for use across operations

EWS Australia
Connect Everywhere

PARTNERING WITH INDUSTRY

Where it started

- EWS identified need for new technology to access data from remote areas
- Manual dip and radio or cellular comms heavily relied upon, but inconsistent and unreliable
- Safety issues and exposure to risks in field
- Running low packet, low power, satellite telemetry across remote mining locations for 6 years
- Enabled data to desktop from anywhere

PARTNERING WITH INDUSTRY

Benefits delivered by EWS telemetry

- SAFETY – Reducing risk of in field incidents (SME, vehicle, weather, wildlife)
- COST SAVINGS – Time in field, travel
- DATA – Power of data to desktop = informed decision making (daily)
- OPPORTUNITY COST – prewarning of events that may impact production, proactive vs reactive
- ANALYTICS – Trending/analysis (regulatory, strategic, evaluation)
- AUTOMATION – Reduce instance of human error
- RELIABILITY – No single point of failure or downtime from extreme weather

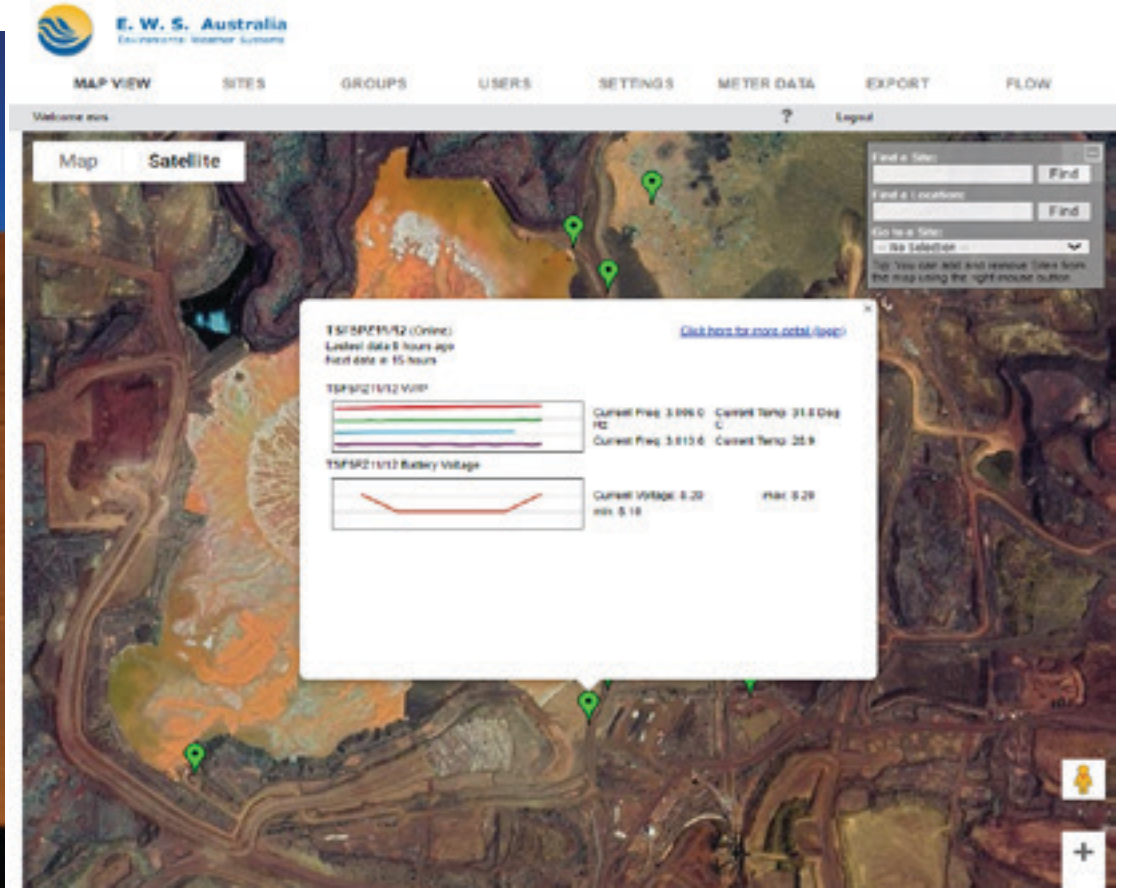
PARTNERING WITH INDUSTRY

Where we are now

- EWS designed Well Cap
- Well Cap transmits low packet, low cost data over Satellite
- Started monitoring ground water levels

PARTNERING WITH INDUSTRY

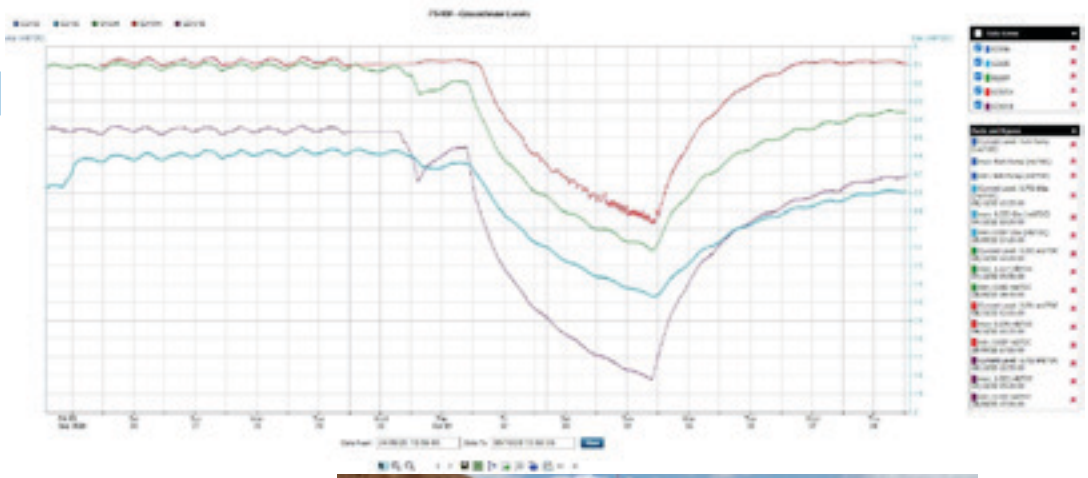
Moved into vibrating wires...



PARTNERING WITH INDUSTRY

Flood warning and research...

PARTNERING WITH INDUSTRY

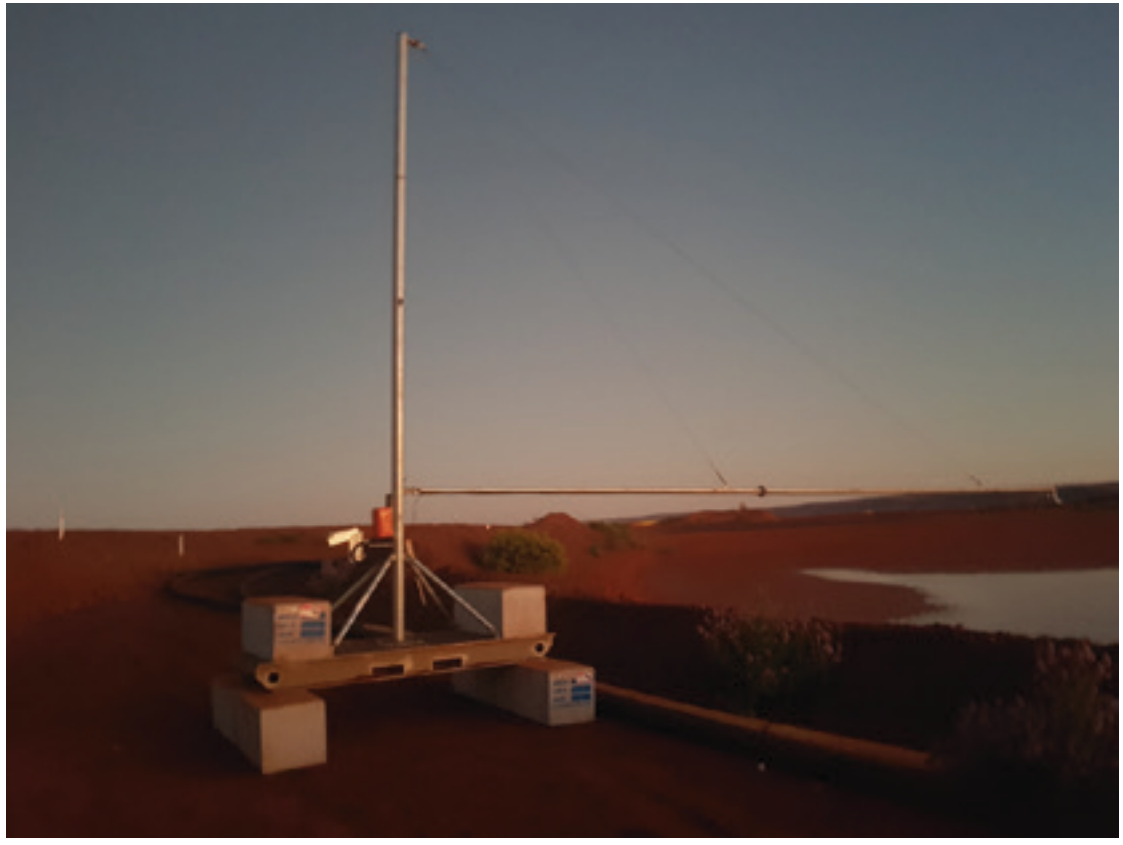


Providing continuity across operations

- Expansion to aluminium and coal operations

RTNERING WITH
USTRY

nuous improvement approach (R&D)



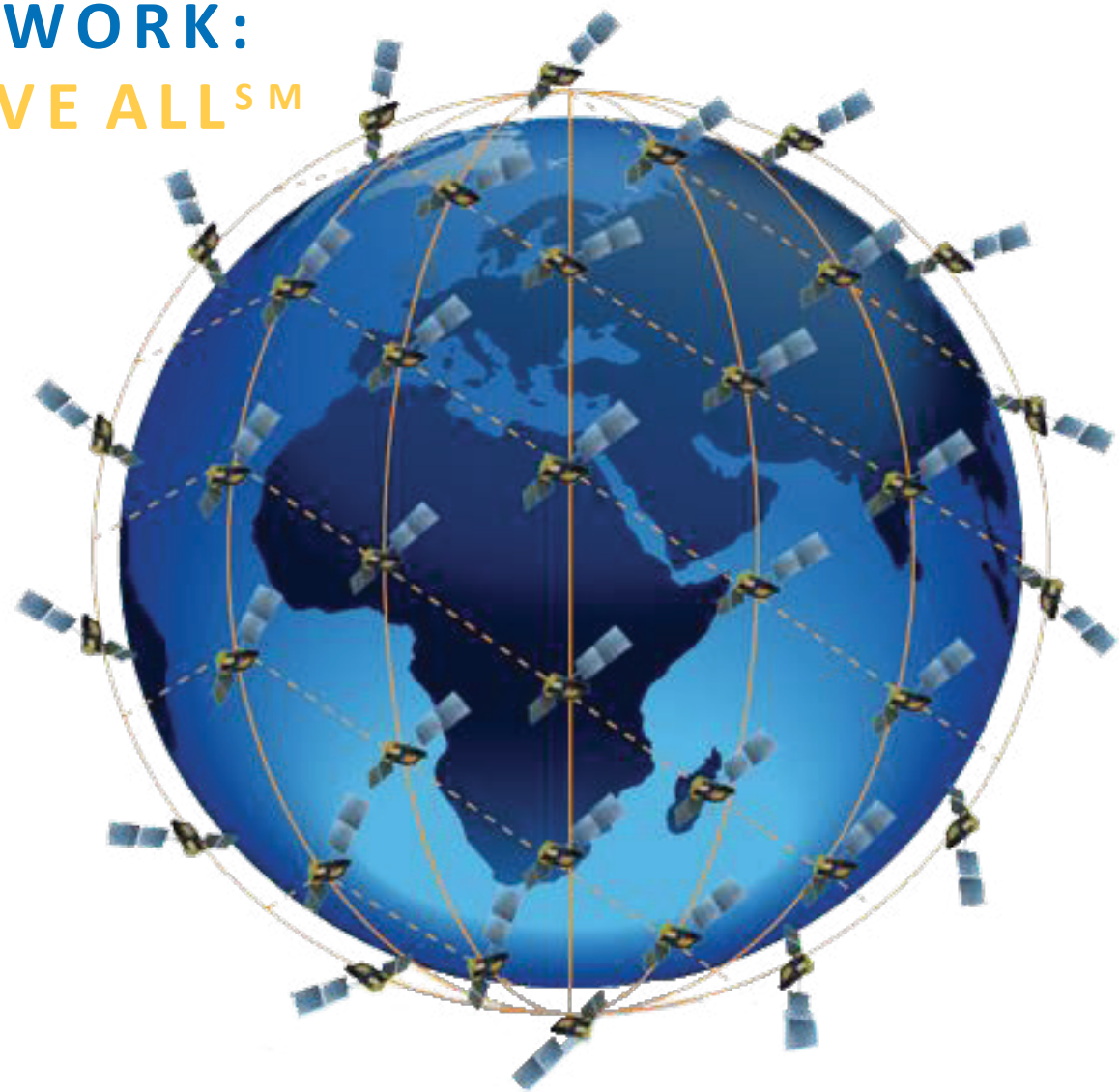
THE IRIDIUM® NETWORK:
RELIABILITY ABOVE ALL℠

66 ACTIVE SATELLITES
- 6 orbital planes with 11 satellites each
- Plus 9 in-orbit spares
- Plus 6 ground spares

LOW-EARTH ORBIT (LEO)
- Enables reliable communications anywhere in the world

L-BAND SYSTEM
- Allows for transmissions even in adverse weather conditions

SATELLITE CROSSLINKS
- Creates low-latency, resilient, high-quality connections



THE IRIDIUM® NETWORK:
BENEFITS OF SATELLITE

Significantly lower costs using short burst data different to conventional airtime

No single point of failure, unlike cellular or radio networks

Changing cell networks limit lifespan of telemetry; 3G, 4G, 5G, what's next??

Moving dynamic mine sites larger pits, waste dumps, remote exploration areas

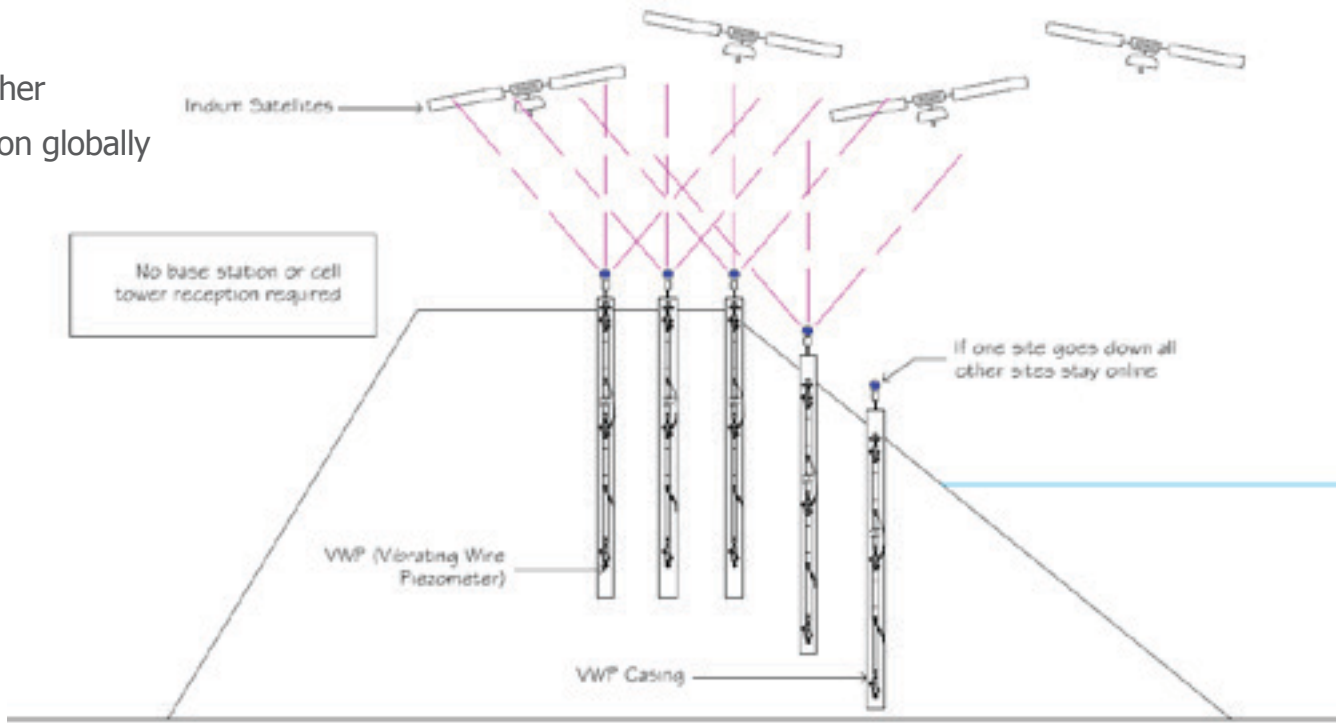
No downtime during extreme weather events

Low orbit Sat works everywhere and is licensed in most country's

THE IRIDIUM® NETWORK:
WHY SATELLITE?

SATELLITE NETWORK

- ✓ No single point failure
- ✓ Not susceptible to weather
- ✓ Reliable from any location globally

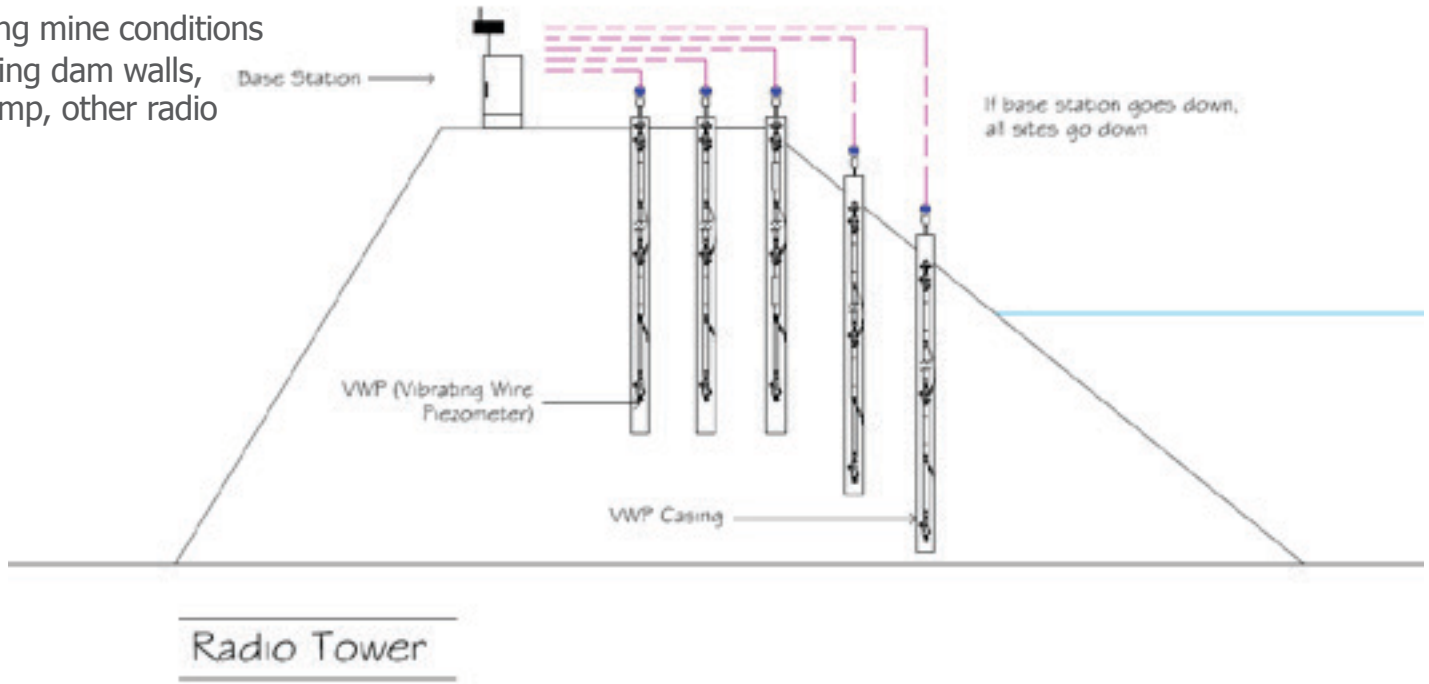


Iridium Satellite

THE IRIDIUM® NETWORK:
WHY SATELLITE?

LINE OF SITE RADIO NETWORK

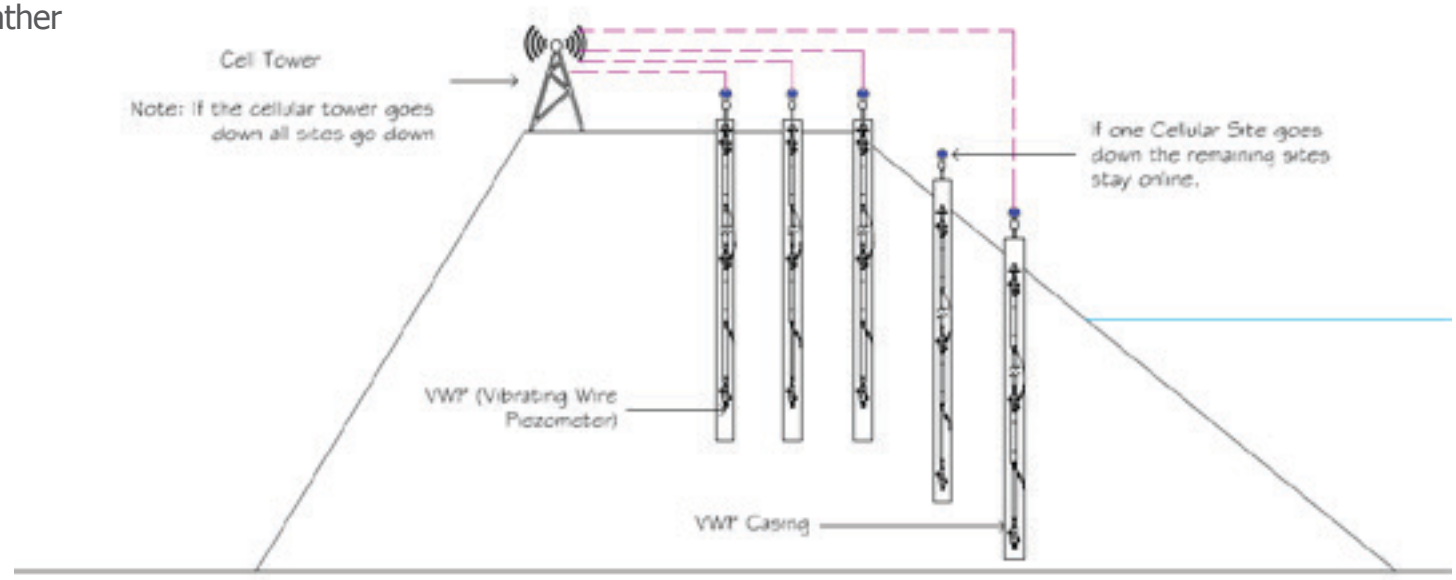
- Single point failure
- Susceptible to weather
- Affected by changing mine conditions e.g., increasing tailing dam walls, benches, waste dump, other radio frequencies



THE IRIDIUM® NETWORK:
WHY SATELLITE?

CELLULAR NETWORK

- Single point failure
- Ever changing tech, creates redundant systems
- Susceptible to weather



Cellular Tower

GLOBAL DOESN'T NEED
A COVERAGE MAP

Terrestrial (ground based) networks only cover approximately 15% of the Earth

EWS Australia
Connect Everywhere

CELLULAR

NEW CAT M1 TECHNOLOGY

- Recent addition to IoT products that require ultra low power consumption
- Medium data rates (up to 375kbps)
- Low Cost
- Ability for OTA FW updates
- Global frequency bands
- Low data cost
- Small modem size (22.5 mm x 26.5 mm footprint)
- Low power consumption (10μA in power saving mode)

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Connect Everywhere

EWS
KEY PRODUCTS

EWS Australia
Connect Everywhere

SWITCH™

Connects with most enviro sensors

Iridium, CAT M1 Cellular communications

IP67, IP68 plug and terminal options

NFC technology or Magnet to switch on

Bluetooth connect or USB

Internal back up lithium battery

OTHER FEATURES

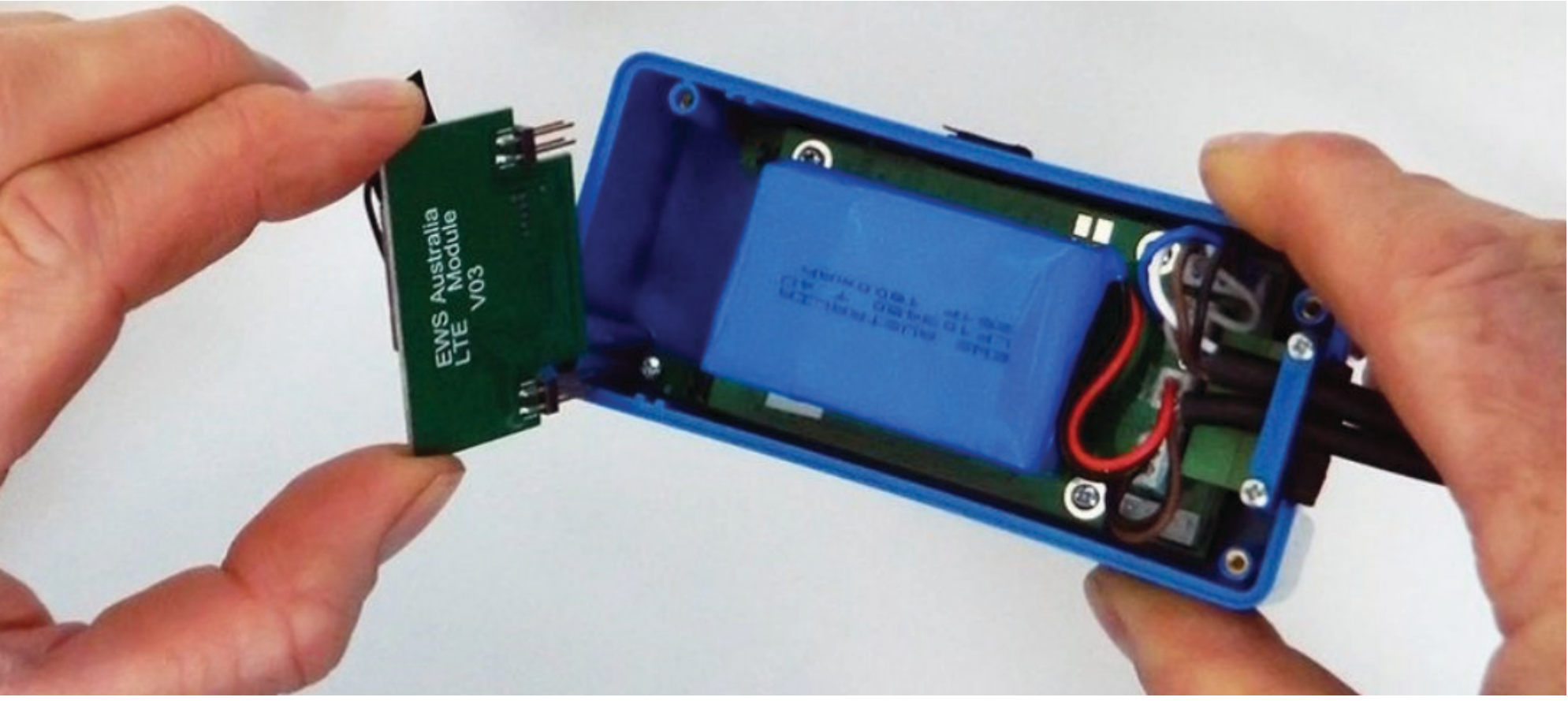
Bluetooth allows for connection to wireless sensors

Two Way communications

Made from 20% recycled products

App for Android and IOS for quick connect set up and test in field prior to deployment

SWITCH™



EWS Australia
Connect Everywhere

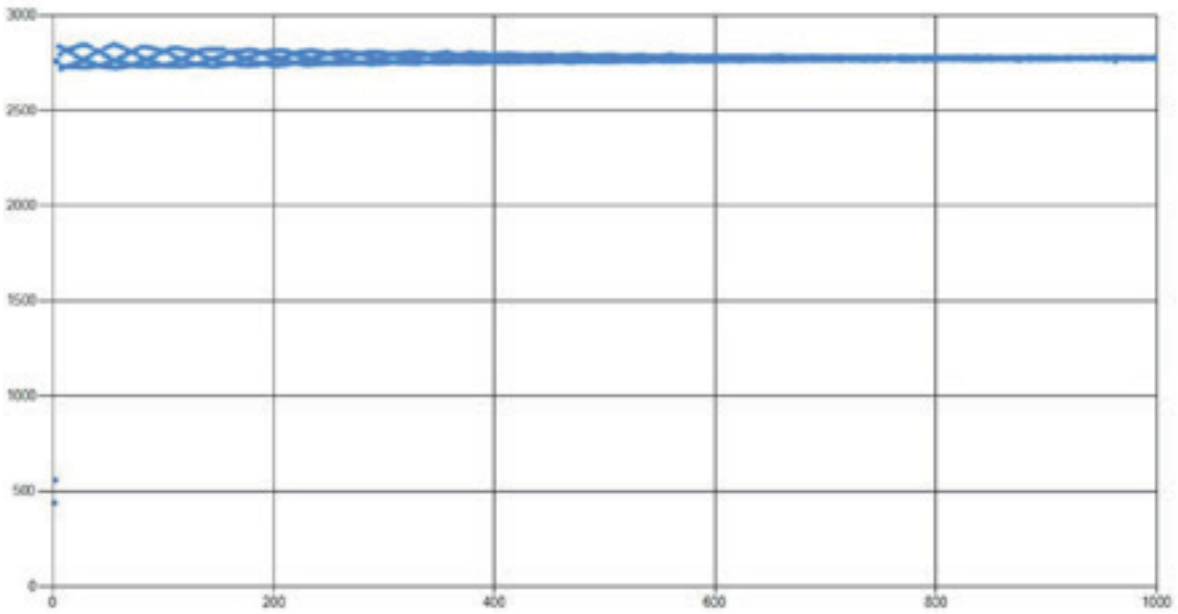
SWITCH-VWT

- Iridium, CAT M1 Cell
- 4 wire terminal direct connect
- Ability to connect other sensors to the same unit (485, SDI, Pulse, 4/20) Rain gauges, flow meters, well caps weather stations, etc.
- Easily expandable to 8 wire
- NFC technology or Magnet to switch on
- Bluetooth connect or USB
- Internal rechargeable battery and solar regulator

OTHER ACCESSORIES / FEATURES

- Connects to any vibrating wire sensor
- Made from 20% recycled products
- Two Way communications
- App for Android and IOS for quick connect set up and test in field prior to deployment

HOW DOES ITWORK?



1. A Vibrating Wire Piezometer (VWP) is attached via a length of cable to the Switch sensor board.
2. The VWP consists of a hardened enclosure that contains:
   a. a tensioned wire connected to piezo pressure transducer.
   b. An electromagnetic coil that is used to both excite the wire and measure the resultant wire vibrations.
3. Changing the applied pressure at the pressure transducer will change the tension on the wire.
4. Similar to a guitar string, changing the tension on the wire will change the frequency that the wire vibrates when it is "plucked".
5. By measuring the frequency of the wire and knowing the relationship between the frequency and the pressure, a pressure reading can be taken.

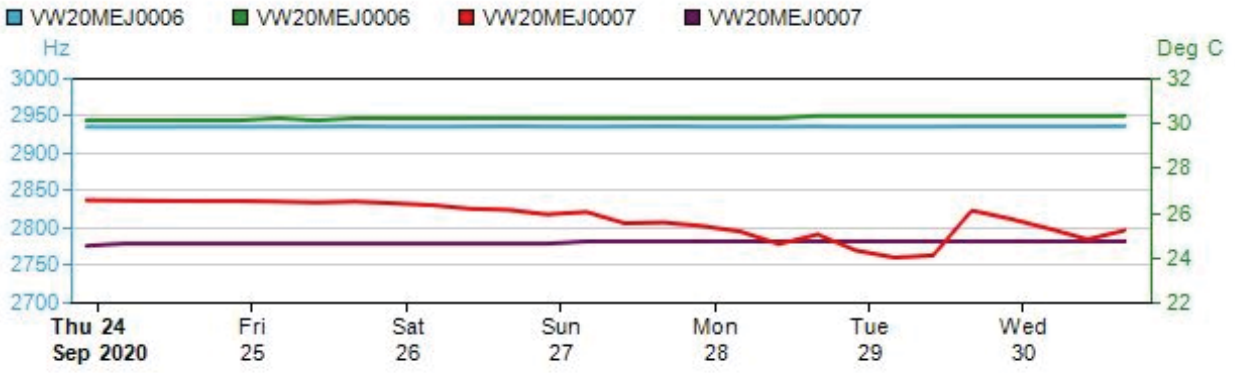
LEADING TECHNOLOGY

What makes the EWS Switch-VWT unique

- Auto sweep frequency scanning configuration (500-5000Hz) – this is fully automated rather than the user having to configure this like other products
- Auto excitation voltage selection – this is also fully automated rather than the user having to configure this. It detects how many volts are required to excite the wires, to return the correct frequency from the VWT. i.e. short cable only 3v, medium 5v, long cable 12v
- Automatic temp compensation – the temp reading returned from the VWP can change with the atmospheric temp changes. The VWT compensates for this providing a true temp reading from the VWP
- Works with existing VWP installations using the above technology

Add row...

TSF3PZ20/21 VWP



VW20MEJ0006 (Hz) **2935.3**

Current Freq **2935.3**

VW20MEJ0006 (Deg C) **30.3**

Current Temp **30.3**

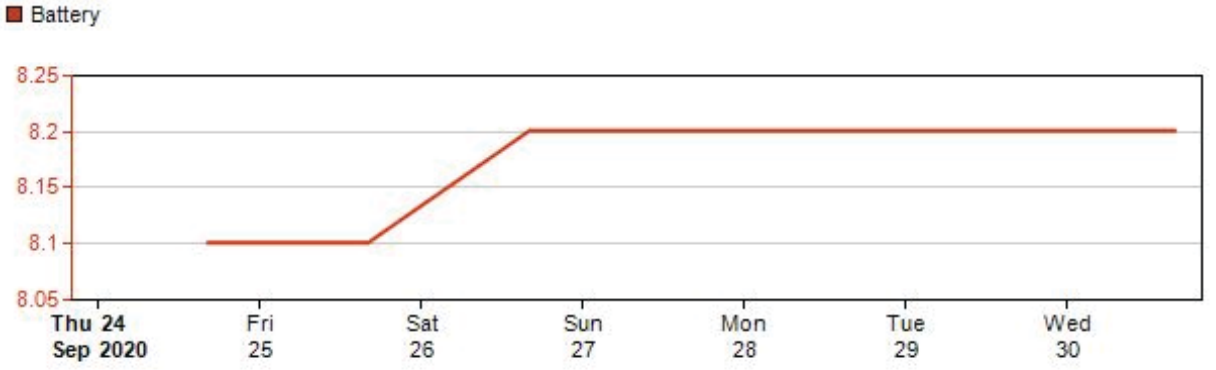
VW20MEJ0007 **2796.2**

Current Freq **2796.2**

VW20MEJ0007 **24.7**

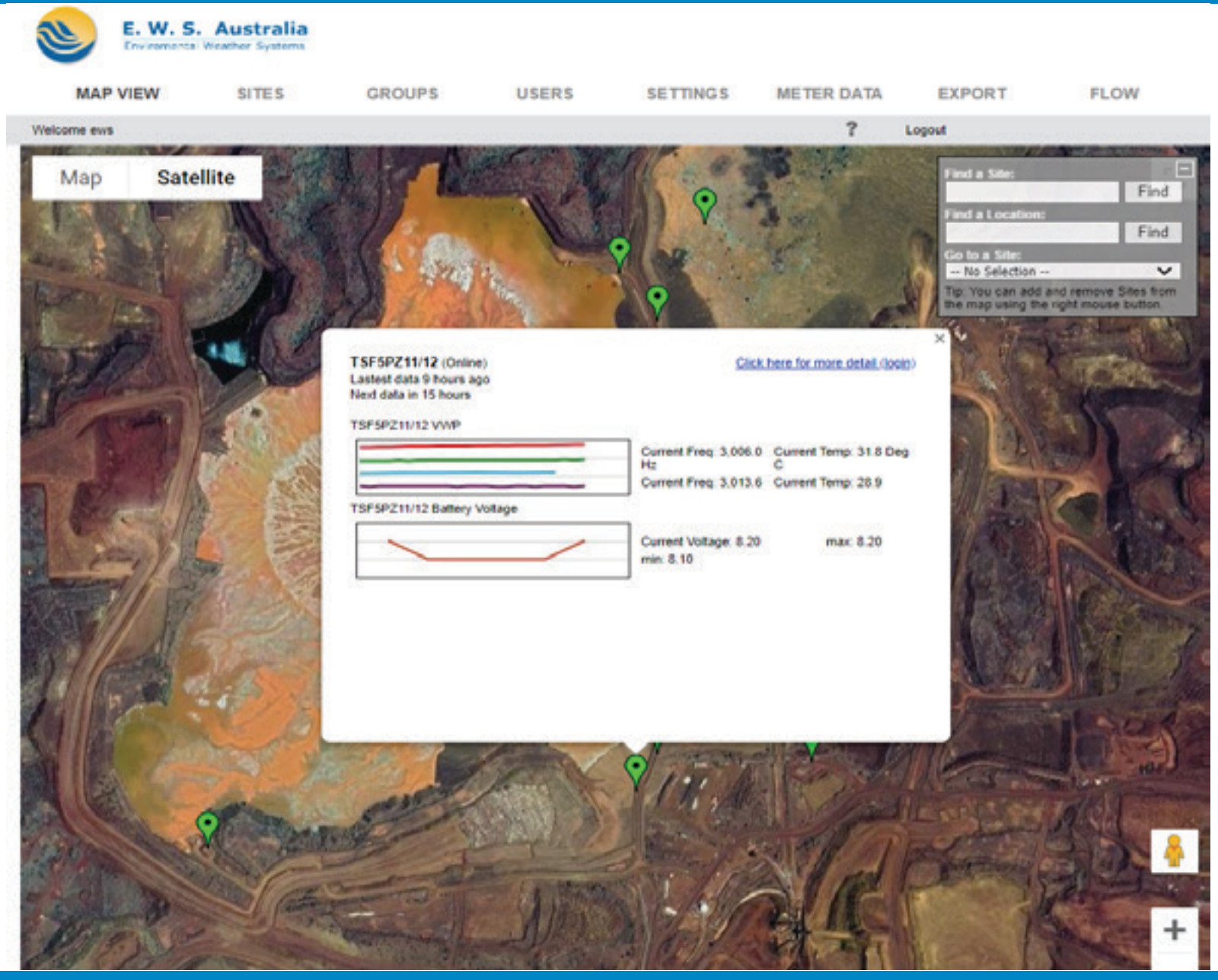
Current Temp **24.7**

TSF3PZ20/21 Battery Voltage



Battery **8.2**

Current Voltage **8.2** Max last 7 days **8.2**
Min last 7 days **8.1**


E. W. S. Australia
Environmental Weather Systems
MAP VIEW
SITES
GROUPS
USERS
SETTINGS
METER DATA
EXPORT
FLOW
Welcome ews
Logout
Map
Satellite
Find a Site:
Find
Find a Location:
Find
Go to a Site:
-- No Selection --
Tip: You can add and remove Sites from the map using the right mouse button
TSF5PZ11/12 (Online)
Click here for more detail (login)
Lastest data 9 hours ago
Next data in 15 hours
TSF5PZ11/12 VWP
Current Freq: 3,006.0 Hz
Current Temp: 31.8 Deg C
Current Freq: 3,013.6
Current Temp: 28.9
TSF5PZ11/12 Battery Voltage
Current Voltage: 8.20
max: 8.20
min: 8.10

WELL CAP

Iridium, CAT M1Cell comms guarantees data from anywhere

Fits on any sized well or casing

Ability to connect other sensors to the same unit (485, SDI, Pulse, 4/20) Rain gauges, flow meters, well caps weather stations, etc.

5 minute set up only an, allen key required

NFC technology or Magnet to switch on

Bluetooth connect or USB

Internal rechargeable battery and solar regulator

Optional solar or lithium battery pack for long life deployment

OTHER ACCESSORIES / FEATURES

Connects to any Level sensor

Fits on any well

Two Way communications

App for Android and IOS for quick connect set up and test in field prior to deployment

WELL CAP

FLOW METER (TFM)

Iridium, CAT M1 Cell comms guarantees data from anywhere

FDN 100 – 400 sizes available

Ability to connect other sensors to the same unit (485, SDI, Pulse, 4/20) Rain gauges, flow meters, well caps weather stations, etc.

E Class flange mounting

NFC technology or Magnet to switch on

Bluetooth connect or USB

Internal rechargeable battery and solar regulator

Optional solar or lithium battery pack for long life deployment

OTHER ACCESSORIES / FEATURES

- Integrated switch transmitter into headworks
- Certified to global standards
- Two Way communications
- App for Android and IOS for quick connect set up and test in field prior to deployment

EWS SMARTPHONE APP

Connect via Bluetooth

Easy to navigate menus

Configure any Modbus, SDI, Pulse, Analog sensor.

Upgrade firmware OTA

No need for cable connections

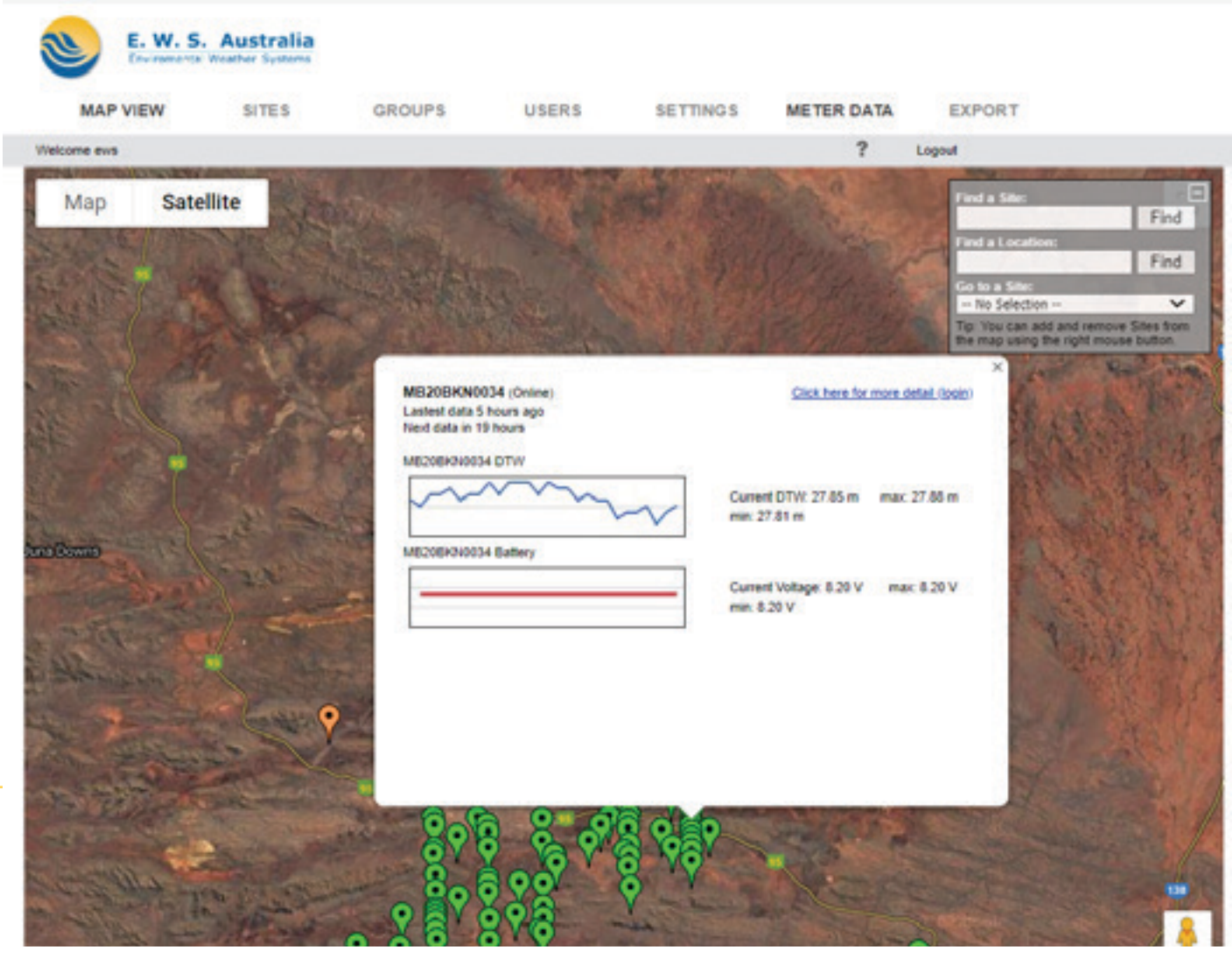
Check Iridium status and force transmissions

Live onsite verifications

Help features including wiring diagrams and manuals

EWS DATA PORTAL

- Map view of sites
- Easy to navigate menus
- Auto export data to any existing database
- Graph or tabular view of data
- Set up SMS and email alarms
- Colour coded alarm status
- Real time data
- 24/7 support



EWS Australia
Connect Everywhere

EWS
TECHNICAL SUPPORT

TROUBLESHOOTING
ROOT CAUSE

- Incorrect communication choice
- Incorrect installation
- Batteries
- Sensor failure
- Wildlife
- Flood events
- Mining activity/machinery impact
- Human impact (untrained)

TROUBLESHOOTING
SOLUTIONS

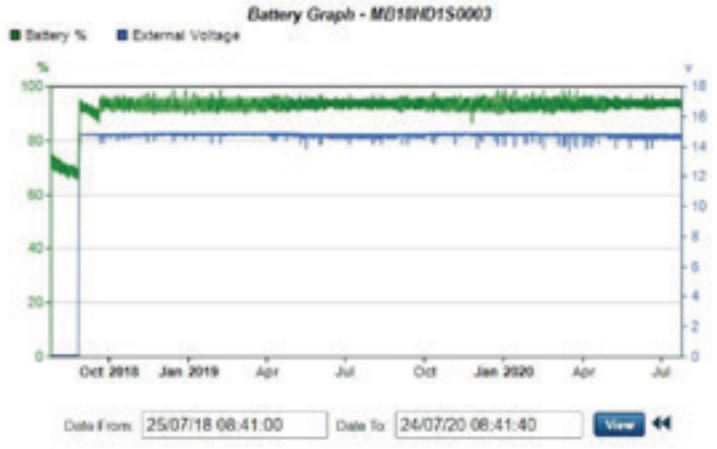
- ✓ Automated alarms for battery/sensor
- ✓ ID sites to create awareness
- ✓ Correct comms choice
- ✓ 24/7 support

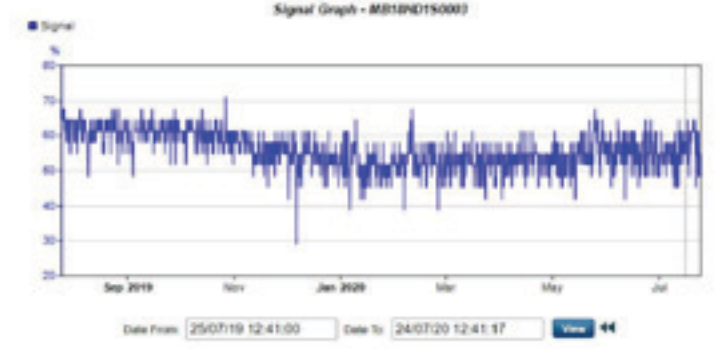
- ✓ Feedback site changes to EWS
- ✓ Training online or in office
- ✓ Correct installation
- ✓ User guides

TROUBLESHOOTING

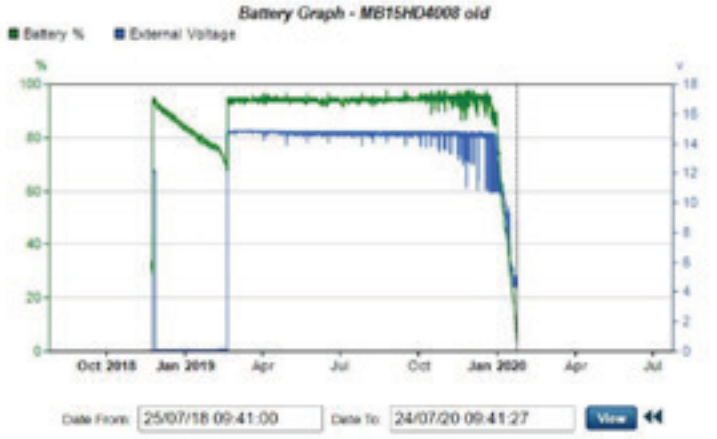
SOLUTIONS – BATTERY LIFE

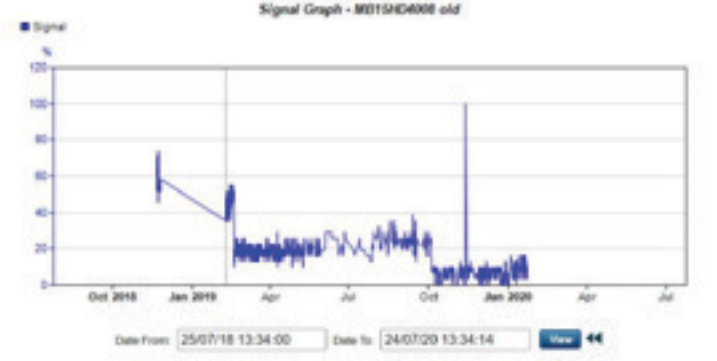
Good Quality Cell Signal vs Battery Life:





Poor Cell Signal vs Battery Life:



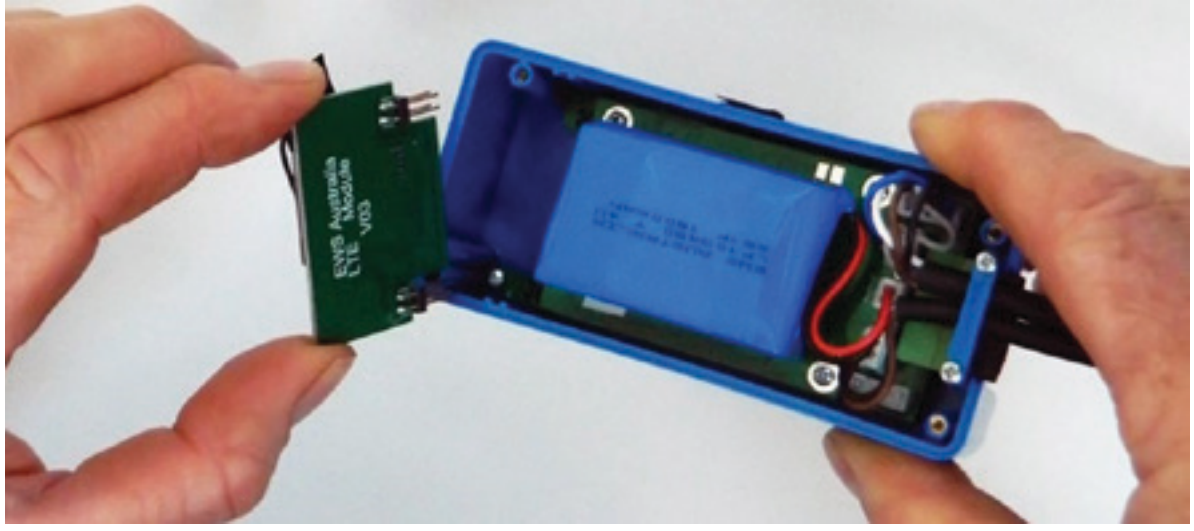


TROUBLESHOOTING SOLUTIONS – INSTALLATIONS

TROUBLESHOOTING

SOLUTIONS – NEW DEVELOPMENT

- Backup battery
- Solar
- Interchangeable modem
- Adapting to user feedback & implementing changes
- Better tech, lower power consumption, easier to use



FUTURE PRODUCT DEVELOPMENT 2021

IRIDIUM HAWK CAMERA