

CONSTRUCTION HYDROACOUSTIC MONITORING

Lessons from the field

Environmental Managers Association of BC

Marc VanderVeer
Hatfield Consultants LLP

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OVERVIEW

- 1 Monitoring equipment
- 2 Hydrophone deployment
- 3 Data collection and processing
- 4 Questions



KEY THEMES

- Hydroacoustic monitoring is critical to avoiding impacts of high-noise construction activities on fish and marine mammals.
- Hydroacoustic monitoring and compliance is a priority for regulators.
- Technical guidance is evolving, but currently limited. Differences exist in the sound thresholds presented in literature vs permit conditions. Thresholds must consider location, species and life stages of local fauna in defining an appropriate monitoring program.
- Field monitoring is often more challenging than expected.
- Knowledge sharing is crucial to effective underwater noise management and monitoring.



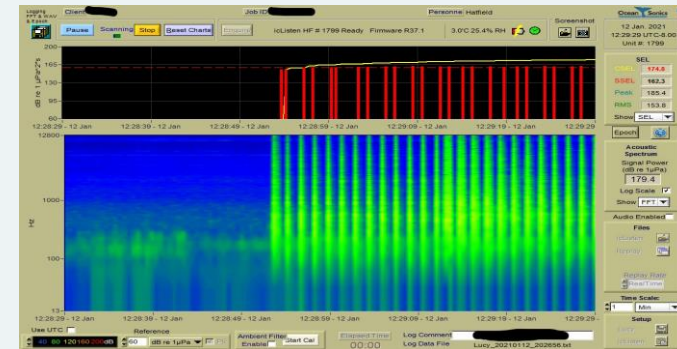


EQUIPMENT

EQUIPMENT

- **Regulatory requirements:**
 - Real time processing of Peak SPL, Cumulative SEL and RMS
- **Field requirements:**
 - Rugged – Able to withstand field conditions
 - User friendly – Reliable, portable, easy to use and troubleshoot

Ocean Sonics SC2-X2 Smart Hydrophone





HYDROPHONE DEPLOYMENT

HYDROPHONE DEPLOYMENT

- Proximity and orientation to pile
- Water depth
- Deployment challenges
 - Current
 - Debris
 - Bubble curtain
 - Safety
- What works?
 - Rigid frames
 - Anchor lines





DATA COLLECTION AND PROCESSING

DATA COLLECTION

1 Monitor ambient sound

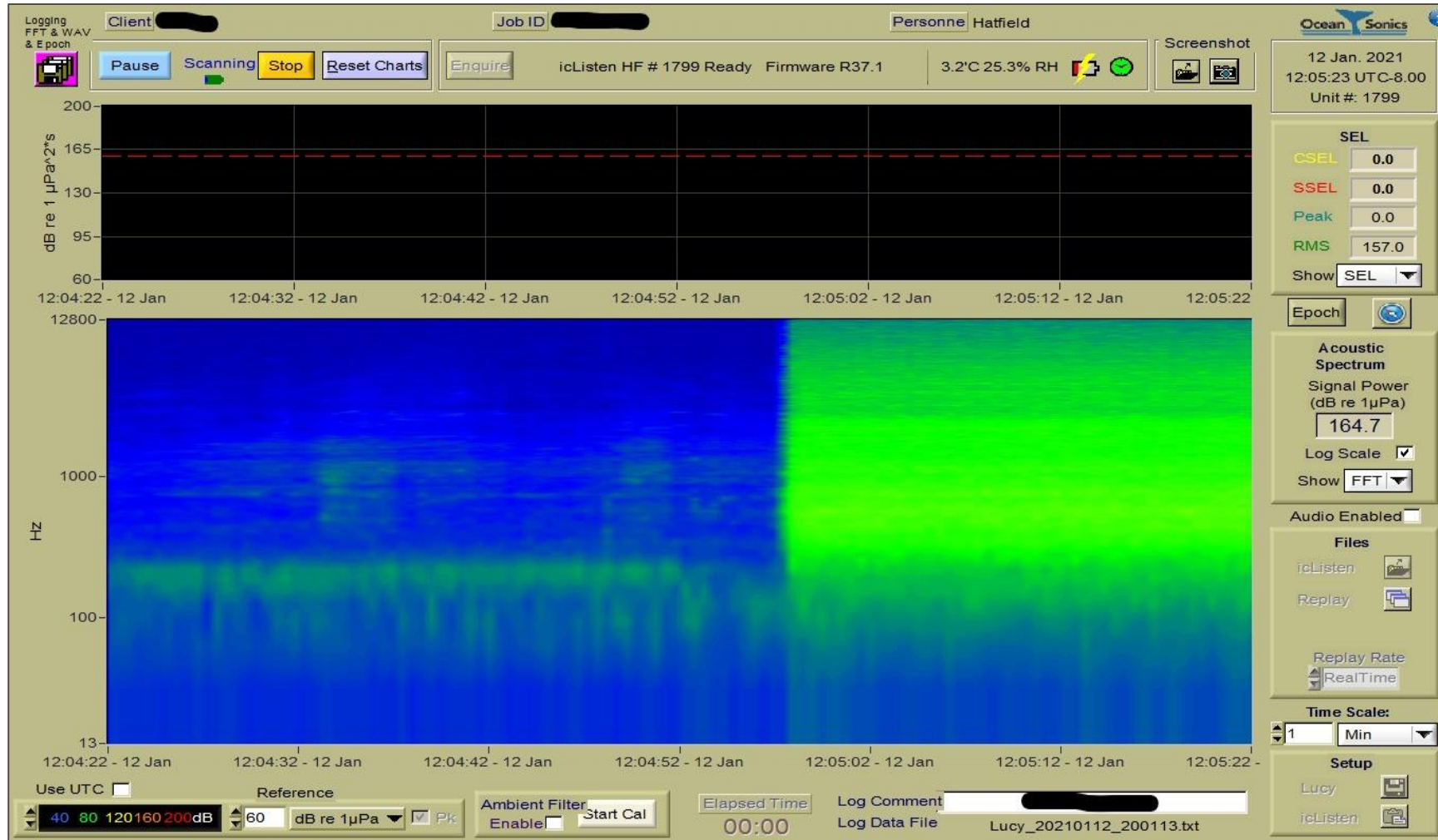
2 Optimize software

3 Monitor incoming data

4 Review and adapt



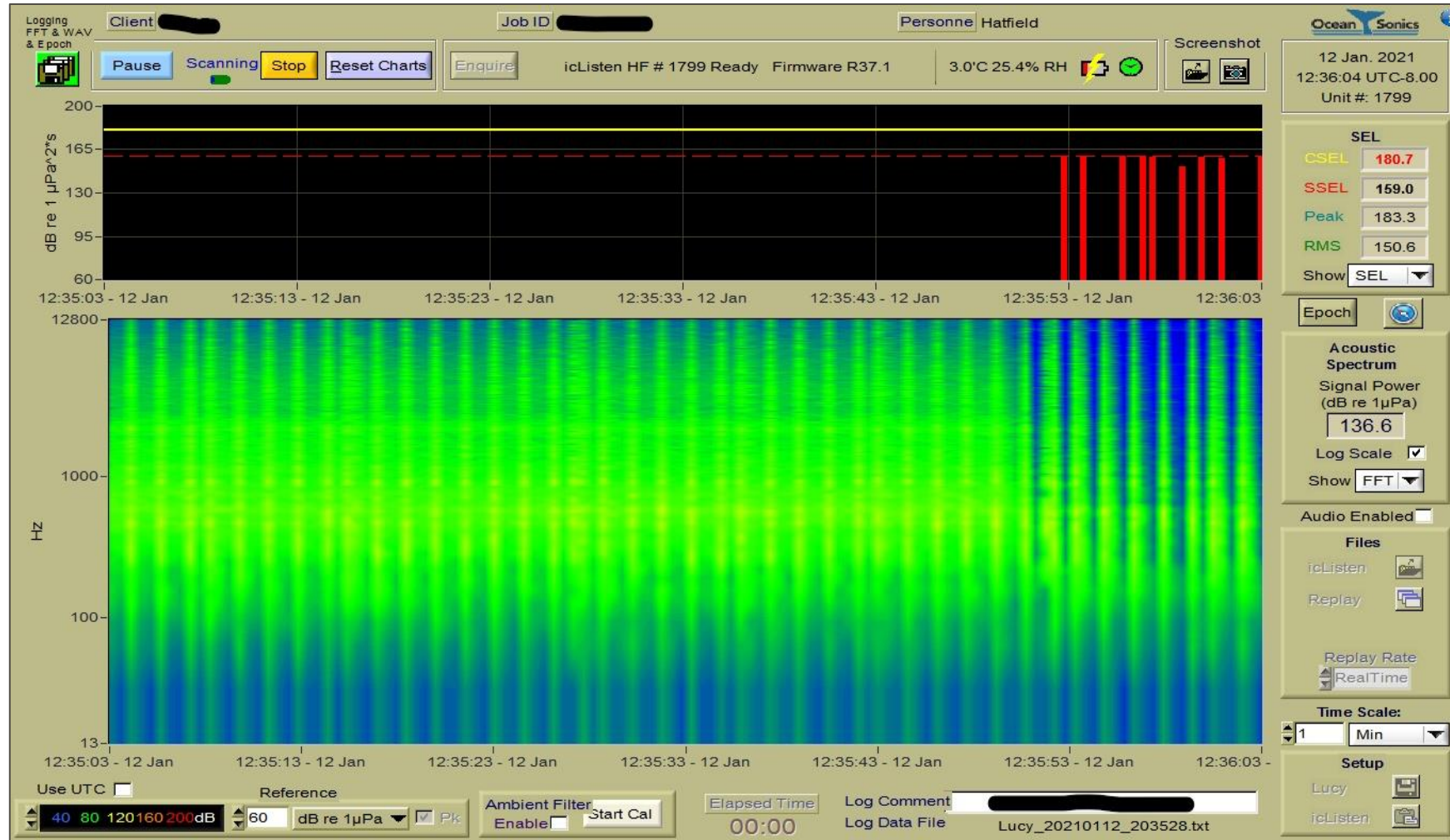
DATA COLLECTION



Example of vibratory pile driving.



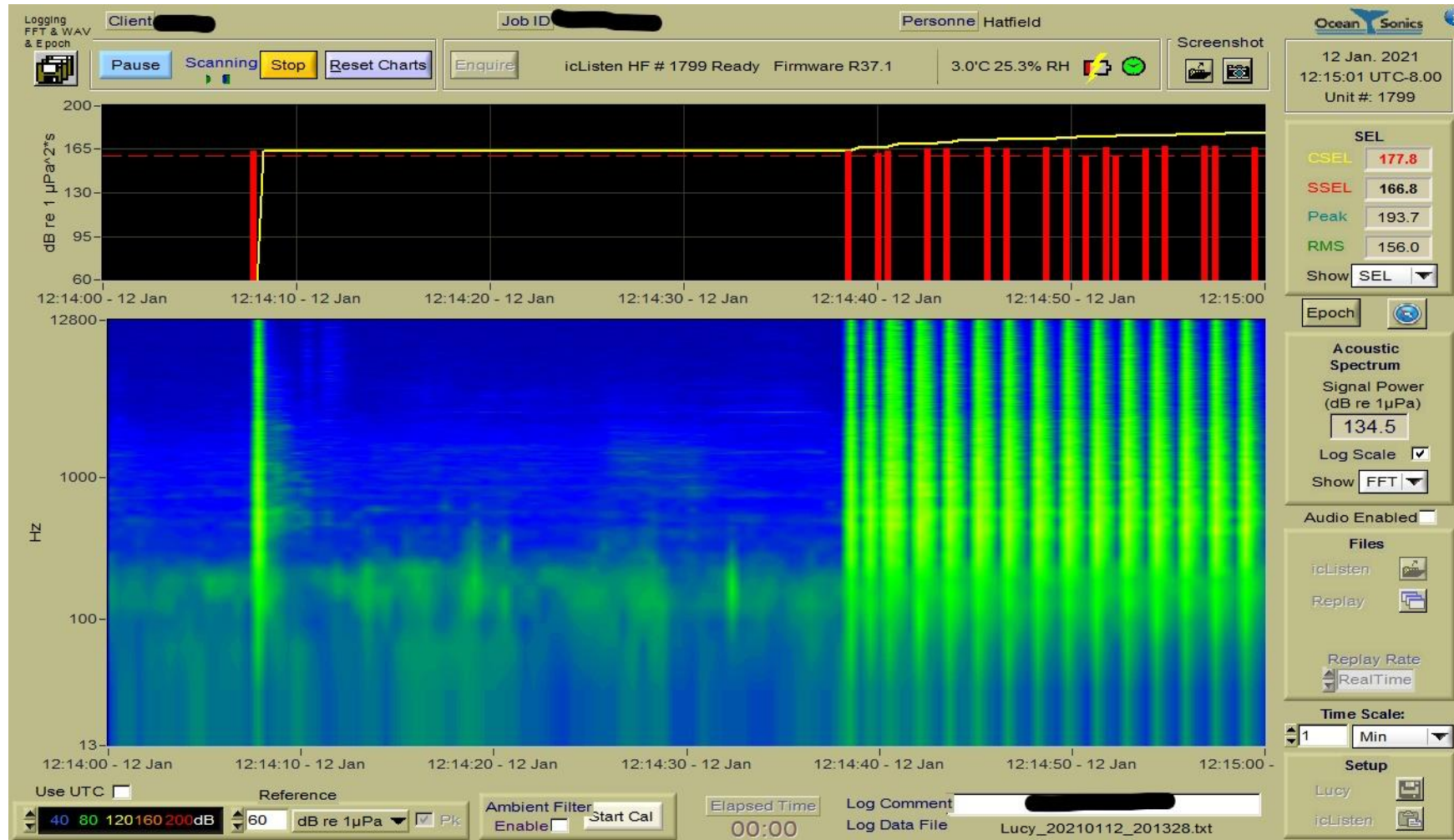
DATA COLLECTION



Example of vibratory pile driving occurring simultaneously with impact hammering.



DATA COLLECTION



Example of impact hammering with proper detection threshold settings.



DATA PROCESSING

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QAQC

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Isolate

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Data presentation

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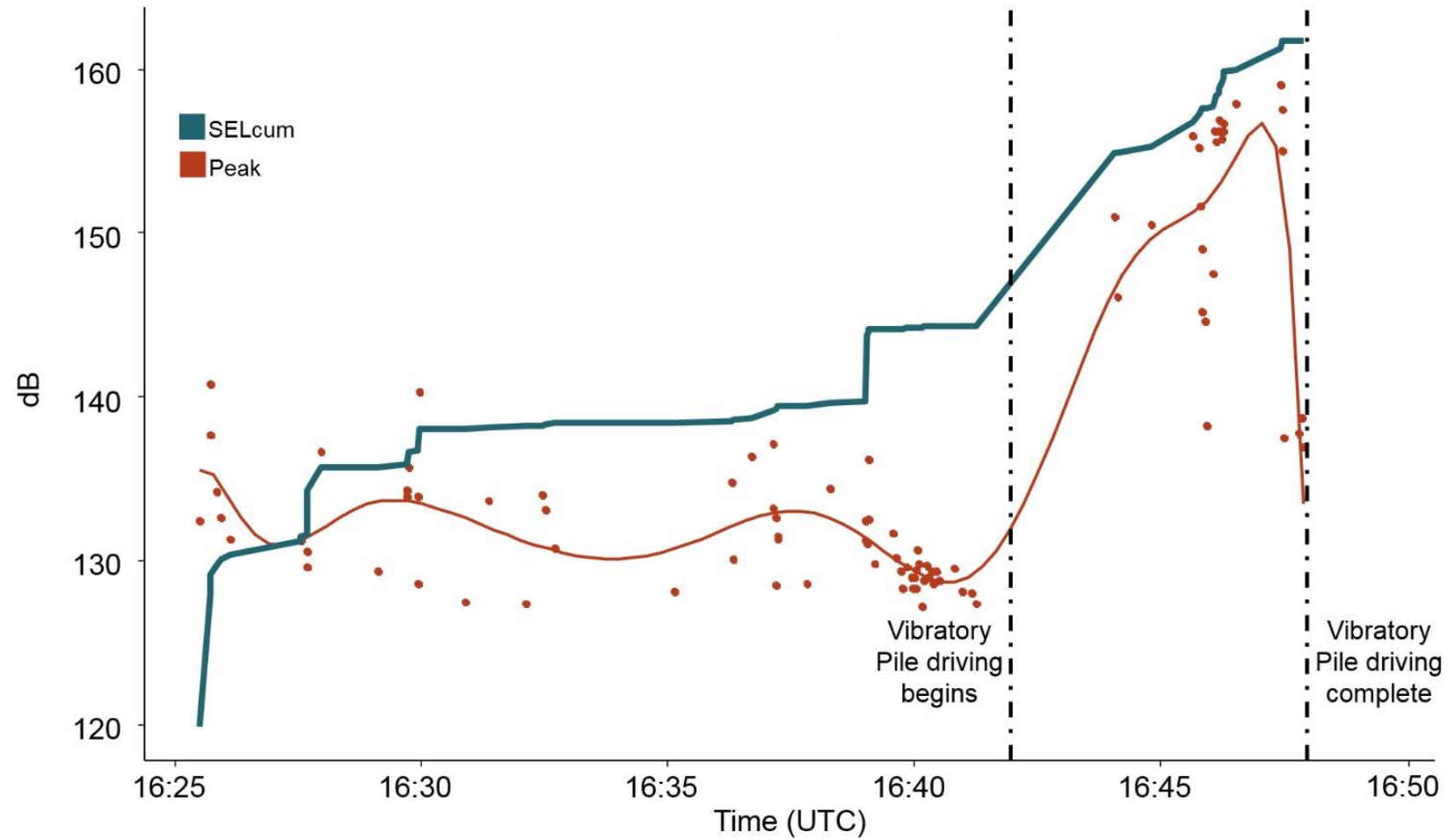
Reporting

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Composer	V.R.B.N.T.A.S.I.B.I.B			
Editor	Revised:	all set on V/L		107
Starting Sample	1/11/1932	Summary: Plan (24)		3262
		V/L Size		2 (2000)
Version Details		all set on V/L		None
Version	1/11/1932	Duration (s)		3
Size	1000	Power Calculations	One Third Distance	
Frequency	V.L.3.3	Assumptions		%

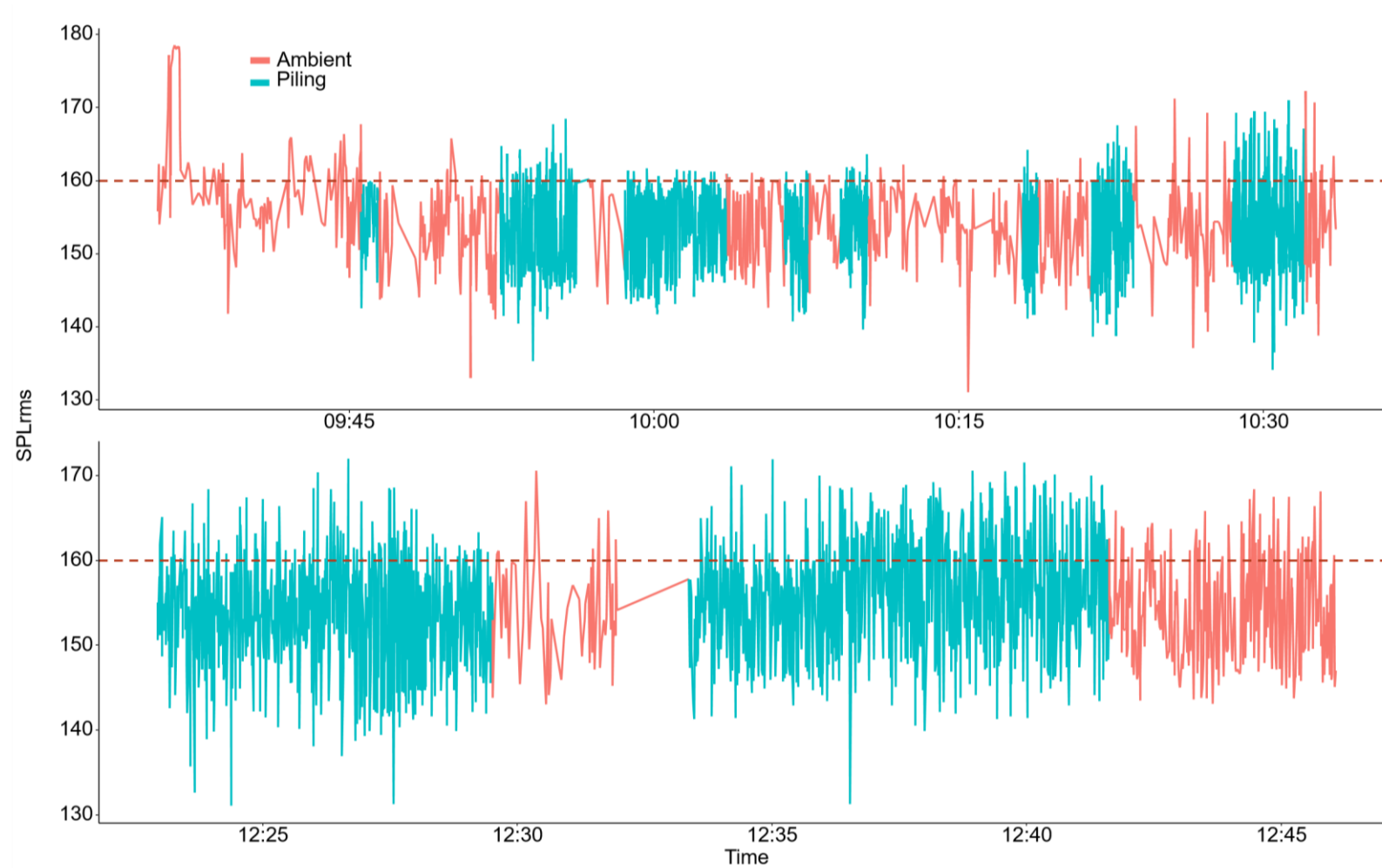
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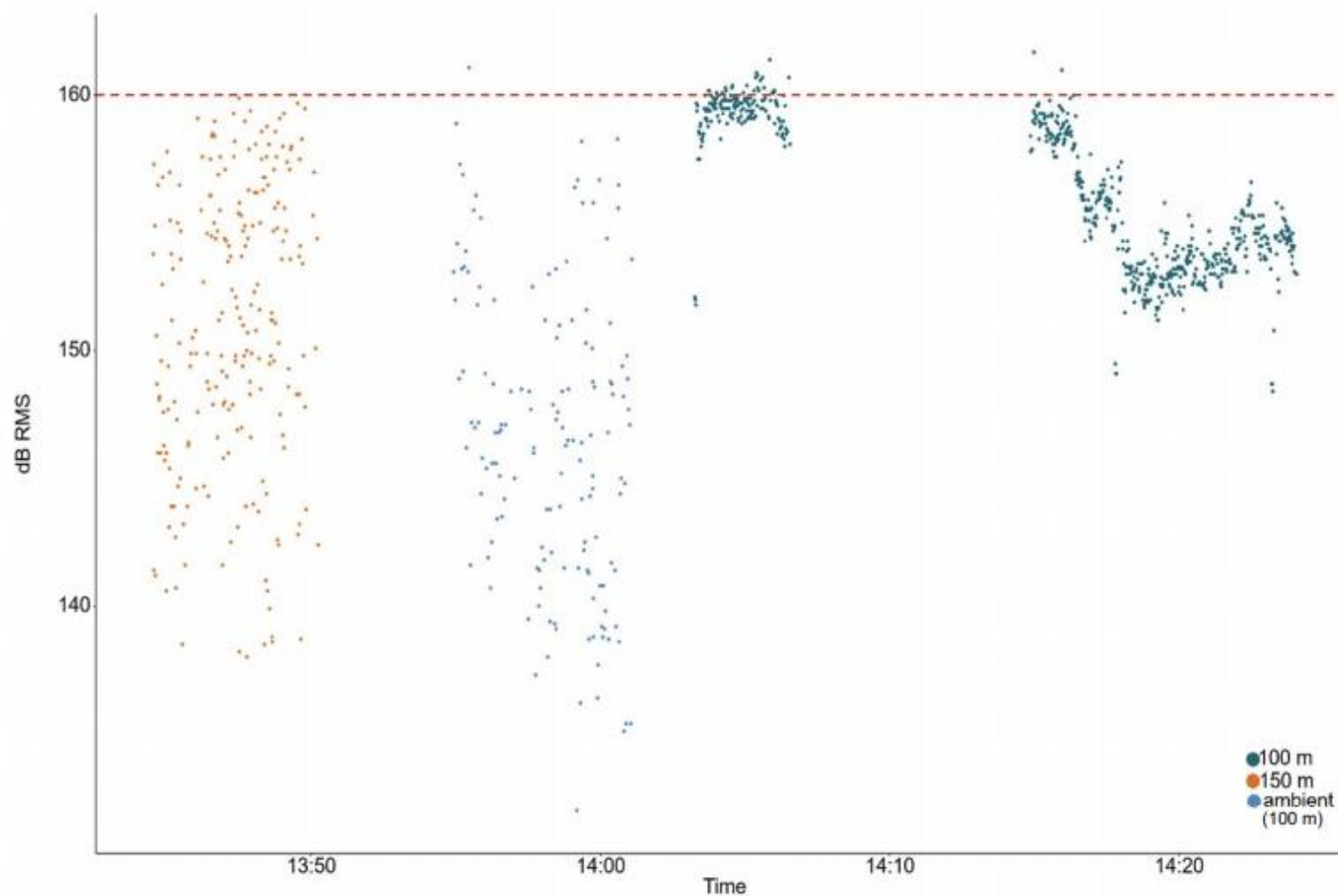
DATA PROCESSING



DATA PROCESSING



DATA PROCESSING





SUMMARY

- Guidance is limited but evolving.
- Monitoring can be challenging, but effective when done correctly.
- Hydrophone position is important, know what to look for.
- Awareness of ambient noise is crucial.
- Anticipate challenges and adapt.



QUESTIONS?

Thank you



Marc VanderVeer

Environmental Specialist

mvanderveer@hatfieldgroup.com

T.: 604.926.3261



Jonathan Vallarta

Principal Acoustical Consultant

jvallarta@slrconsulting.com

T.: 604.240.1715

