Workplace Safety North

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Mitigation Exposure to Occupational Health Hazards in Ontario's Natural Resources Sectors

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Problem Statement

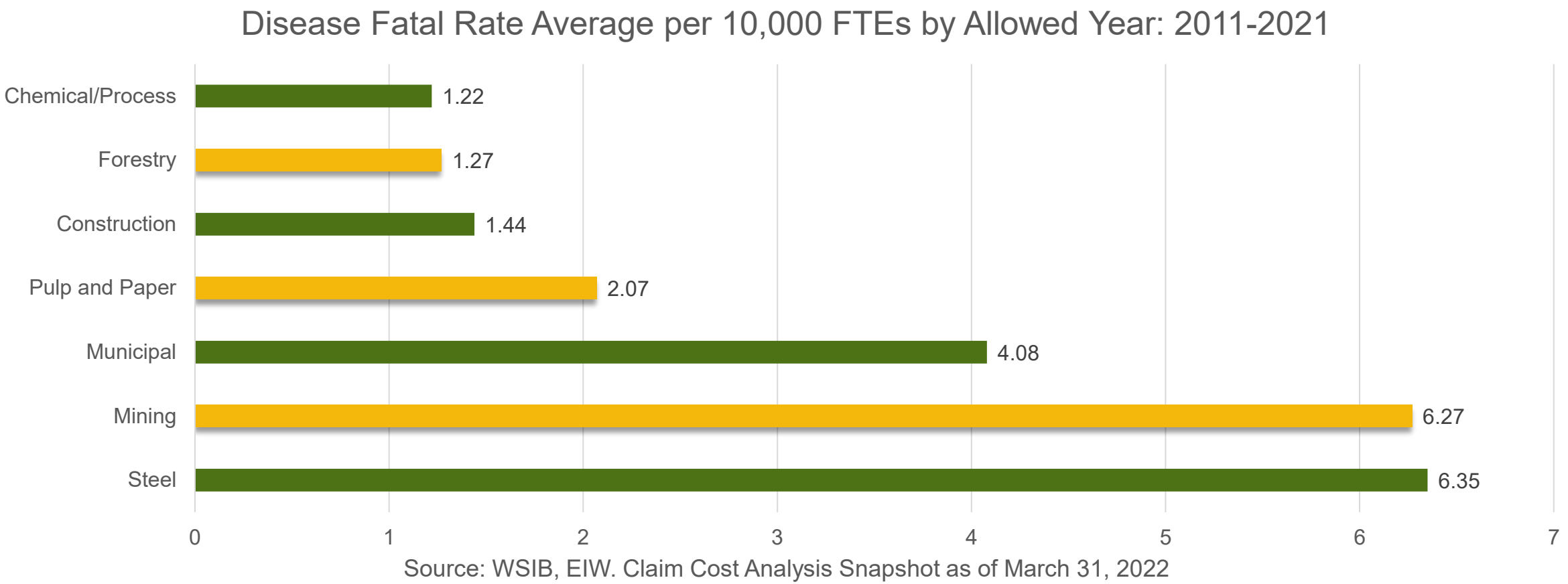
Knowledge Gap:

- Ontario's Natural Resources sectors have some of the province's highest occ. illness fatalities.
- Too few qualified professionals to monitor hazard exposures and meet legislation.
- Many organizations lack resources to manage hazards effectively (field-level competency gap).
- Limited access to basic and intermediate industrial hygiene training worsens the issue.
- The gap is urgent as stricter limits—such as diesel exhaust in mines—require greater workplace compliance and expertise.

Scope of the Issue and Importance:

- Occ. illnesses result in significant worker harm, financial costs, regulatory pressure.
- By addressing knowledge/skills gaps, this project seeks to reduce exposure, prevent illnesses, and align workplaces with regulatory standards.
- By designing a training program intended to be delivered in days rather than years, we have a way to close this gap.
- Closing this gap has the potential to improve worker safety, reduce compensation claims, and establish a framework for sustainable hazard management.

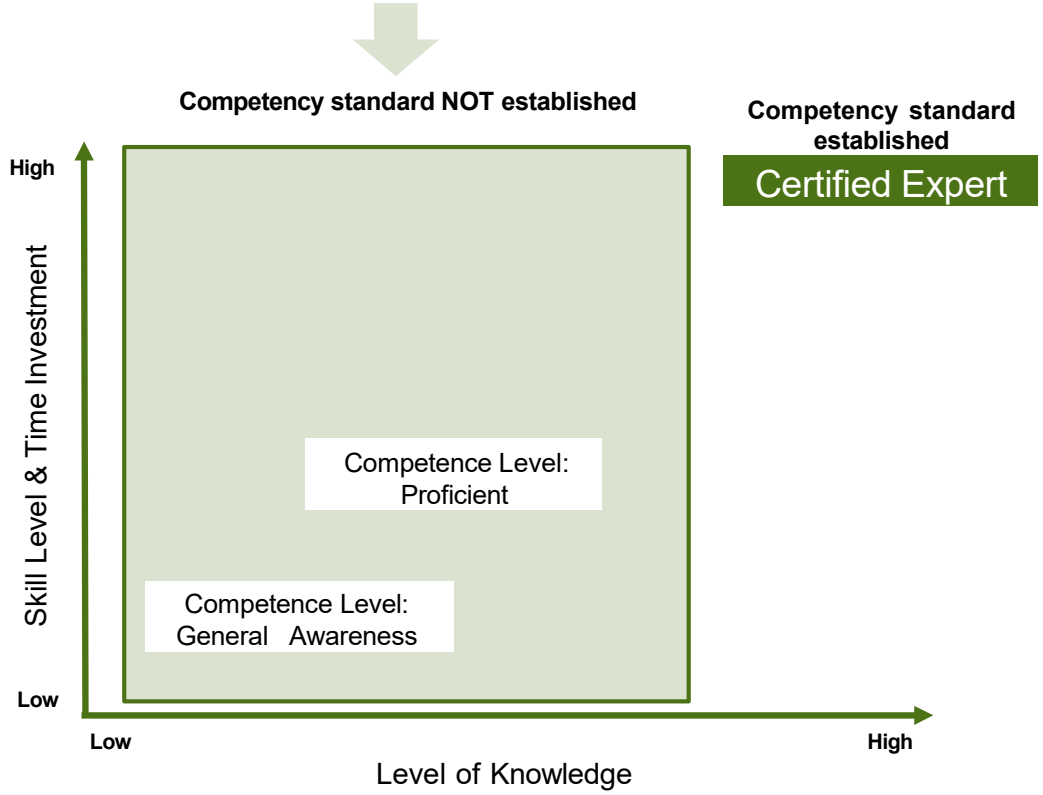
Problem/Need
(Natural resources sectors)



Problem/Need

Very few highly-skilled experts are available to monitor these hazards

This research project focuses on filling this gap.



In 2020, the American Board of Industrial Hygiene (ABIH) /the Board for **Global** EHS Credentialing (BGC) — reported that there were 6,940 certified industrial hygienists (CIH) globally

- 6,225 were in the United States (90%)
- **448** in Canada (6%)
- 92 in China
- 37 in Singapore
- 34 in Hong Kong
- 30 in India and Australia (each)
- 15 in South Korea
- 13 in Malaysia
- 8 in Taiwan and Saudi Arabia (each).

The **Canadian** Registration Board of Occupational Hygienists (CRBOH) reported

- **316** ROH and ROHTs active members

*Note: it is not uncommon to hold both designations

Source:
Occupational hygiene holds important place within profession - OHS Canada MagazineOHS Canada Magazine

Putting the IH Bug in Organizations and Workers

Goal:

- Establish an effective occupational health hazard management industry standard (competency framework)
- Deliver at scale, in a cost-effective and timely manner
- Evaluated by an independent 3rd party (IWH) to prove effectiveness
  - The content and model are impactful
  - The approach leads to increased controls and/or reduced exposure
  - Ultimately leading to a decrease in occupational illnesses

Outcomes:

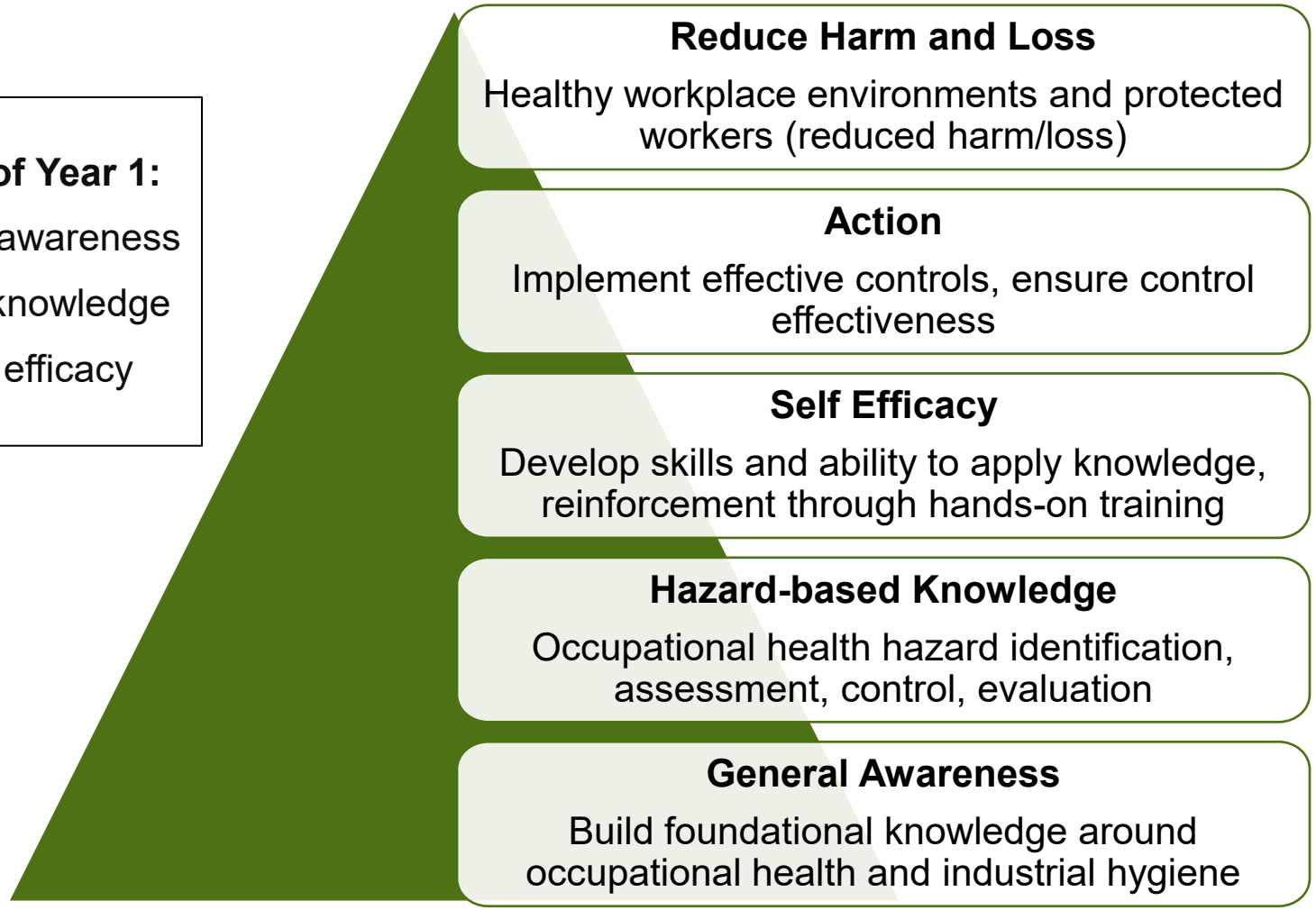
- Development of a repeatable, scalable competency framework for occupational illness prevention, applicable across multiple sectors in Ontario (and potentially beyond).
- Equip workplaces with skilled personnel to effectively address occupational health hazards.
- Sustainable reduction in occupational illness fatalities and claims through consistent hazard monitoring and the application of effective control measures.

Breakdown of Research Project

Objectives and outcomes

Objectives of Year 1:

- Increase awareness
- Improve knowledge
- Build self efficacy



Objectives of Years 2 to 5:

- Build on Year 1 achievements
- Show how awareness, knowledge and self-efficacy lead to effective action
- Demonstrate effective action leads to reduced harm & loss

Project Details – Year 1

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Project Details
(Year 1: Purpose)

- Improve workplace hazard awareness and monitoring practices
- Reduce exposure (increase protection against) targeted occ. health hazards (diesel, silica, noise, wood dust)
- Evaluate training effectiveness and identify system-level barriers

Note: All photos in this presentation show actual participants in this research project.

2025 Research Overview

Making Ontario's Natural Resources Sector Healthier	
Competency/upskilling framework	Reduced exposure to harmful occupational hazards
Controls to health hazards are effective and reduce exposure levels	Understand factors affecting control implementation

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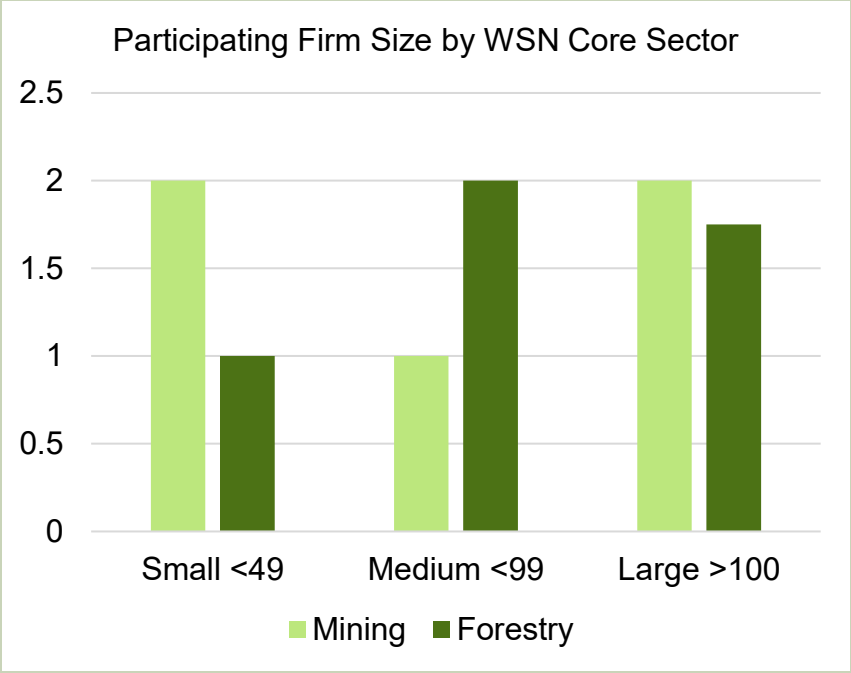
Institute for Work & Health | Research Excellence Safe Work Healthy Workers

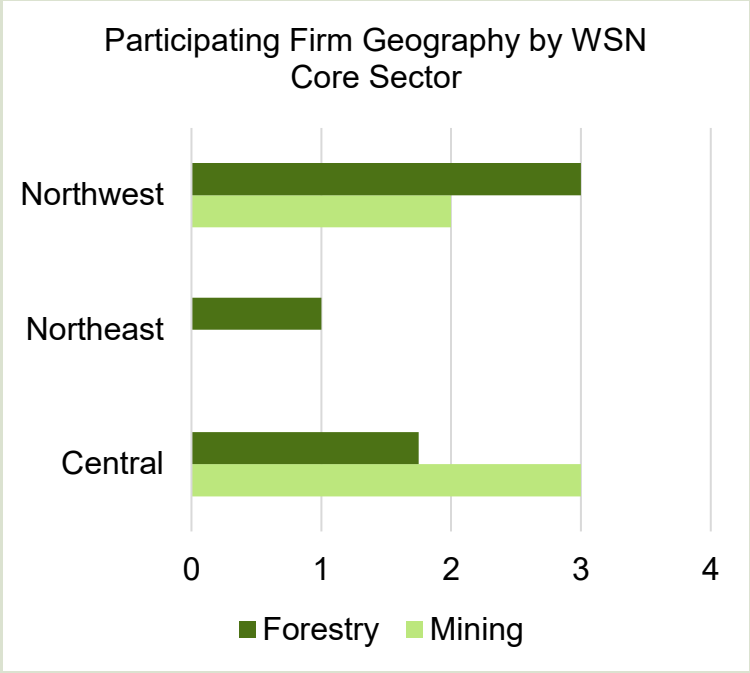
Project Process

Steps	Client Intake	Training	Consulting	Control Program
Details	• Application • Vetting • Acceptance • Leadership engagement	• IH Fundamentals • Hazard specific: Diesel particulate; Wood dust; Silica; Noise	• Monitoring • Coaching • Skills application	• Workplace and hazard-specific control program • Custom report from IWH
WSN	 **10 firms**	 **Virtual and in-person**	 **Hands-on**	 **Customized**
IWH	Pre-intervention culture survey	Pre- and post-assessments	• Pre- and post-intervention self efficacy survey • Qualitative interviews (participants)	• Post-intervention self-efficacy survey • Post-intervention culture survey • Qualitative interviews (workplace members)

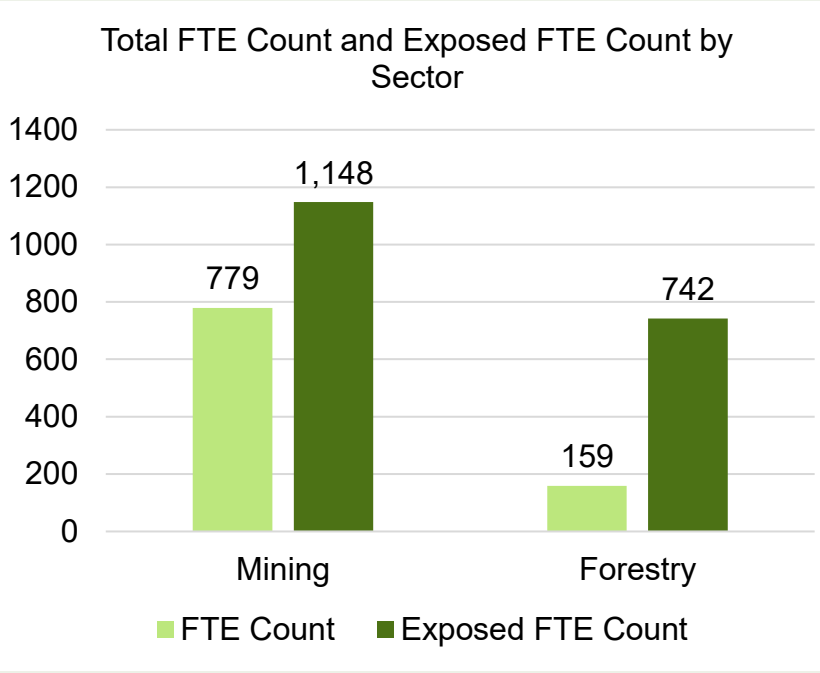
Reach Overview



Engaged various business sizes across forestry and mining sectors, for a total of 1,927 FTEs



21 participants were trained across Northern and Central Ontario



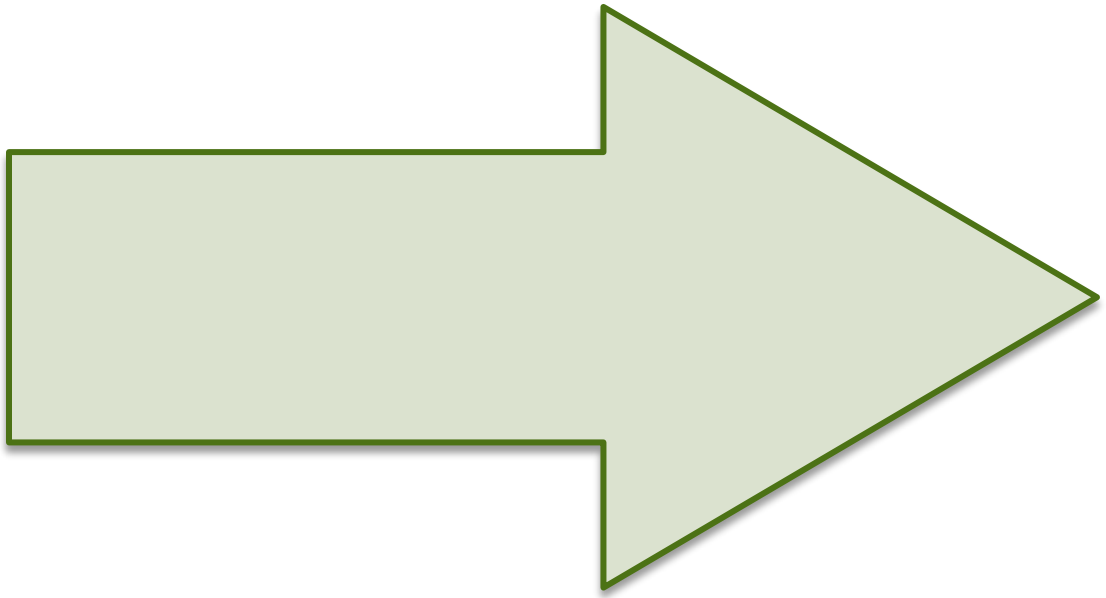
Through this project, we impacted 901 FTEs directly exposed to occupational hazards

Knowledge Outcomes

Objective: Increase knowledge of occupational health hazards

Key Performance Indicator

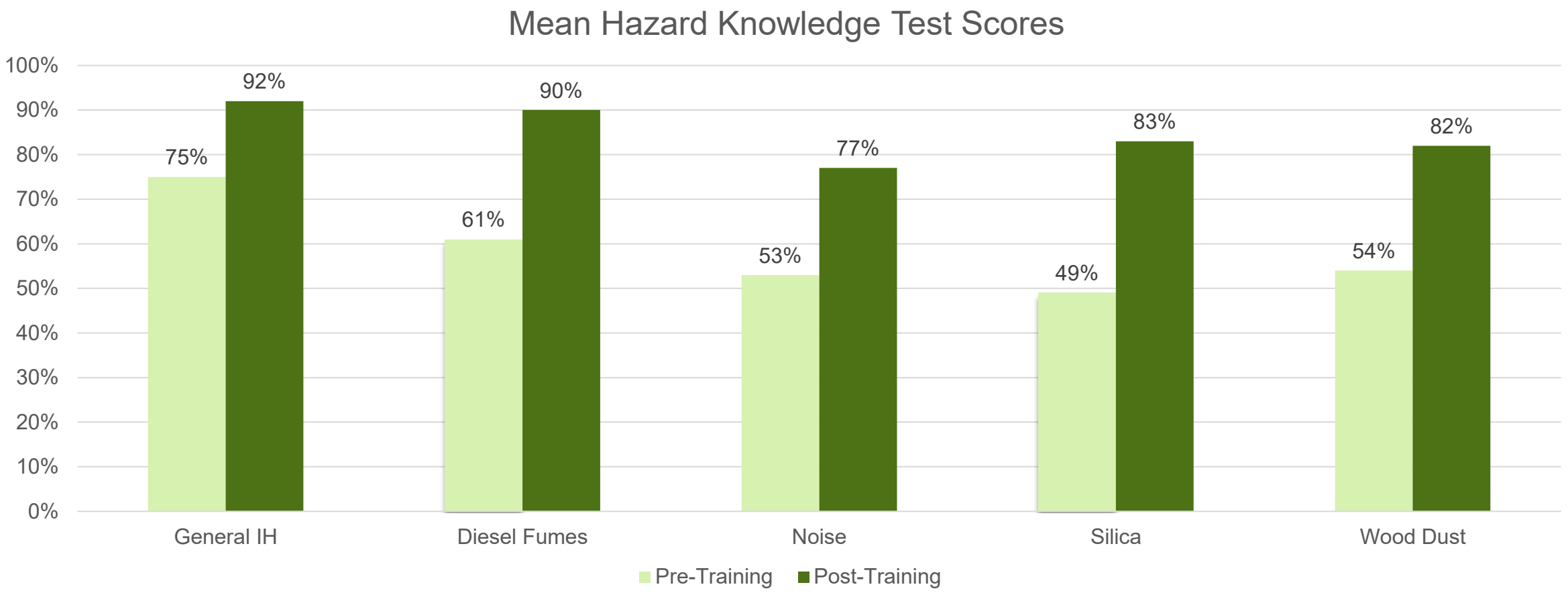
% of mentees demonstrating an improvement in knowledge of occupational health hazard



Interim Results*

83%	IH Fundamentals
79%	Diesel
83%	Noise
100%	Silica
92%	Wood Dust

Impact – Knowledge

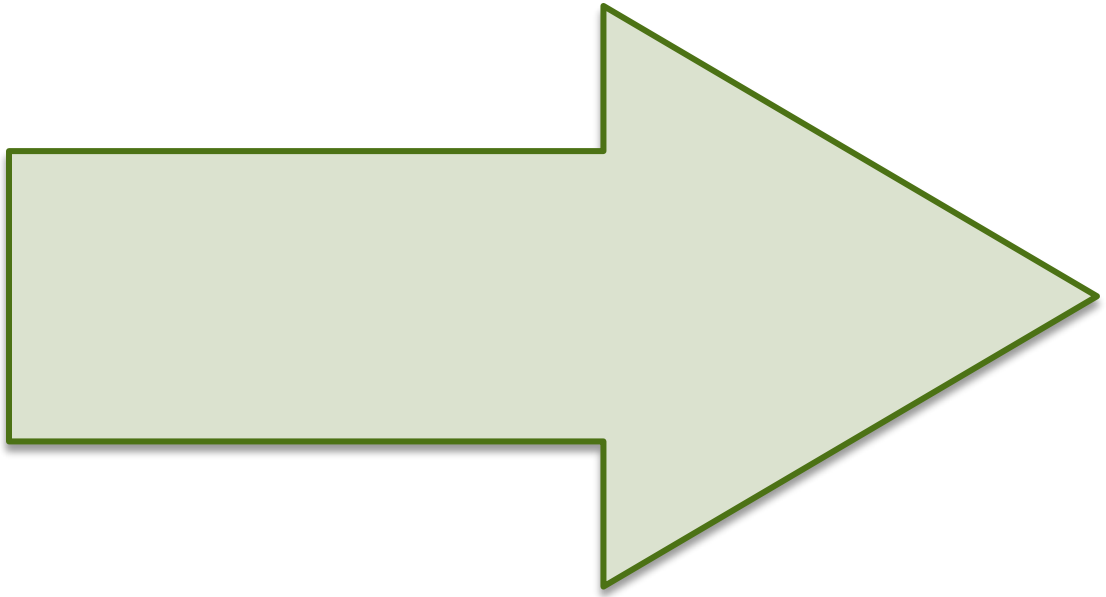


Self Efficacy Outcomes

Objective: Improve self efficacy – translate knowledge into application (skill and ability)

Key Performance Indicator

% experiencing an increase in self efficacy post-training/ coaching

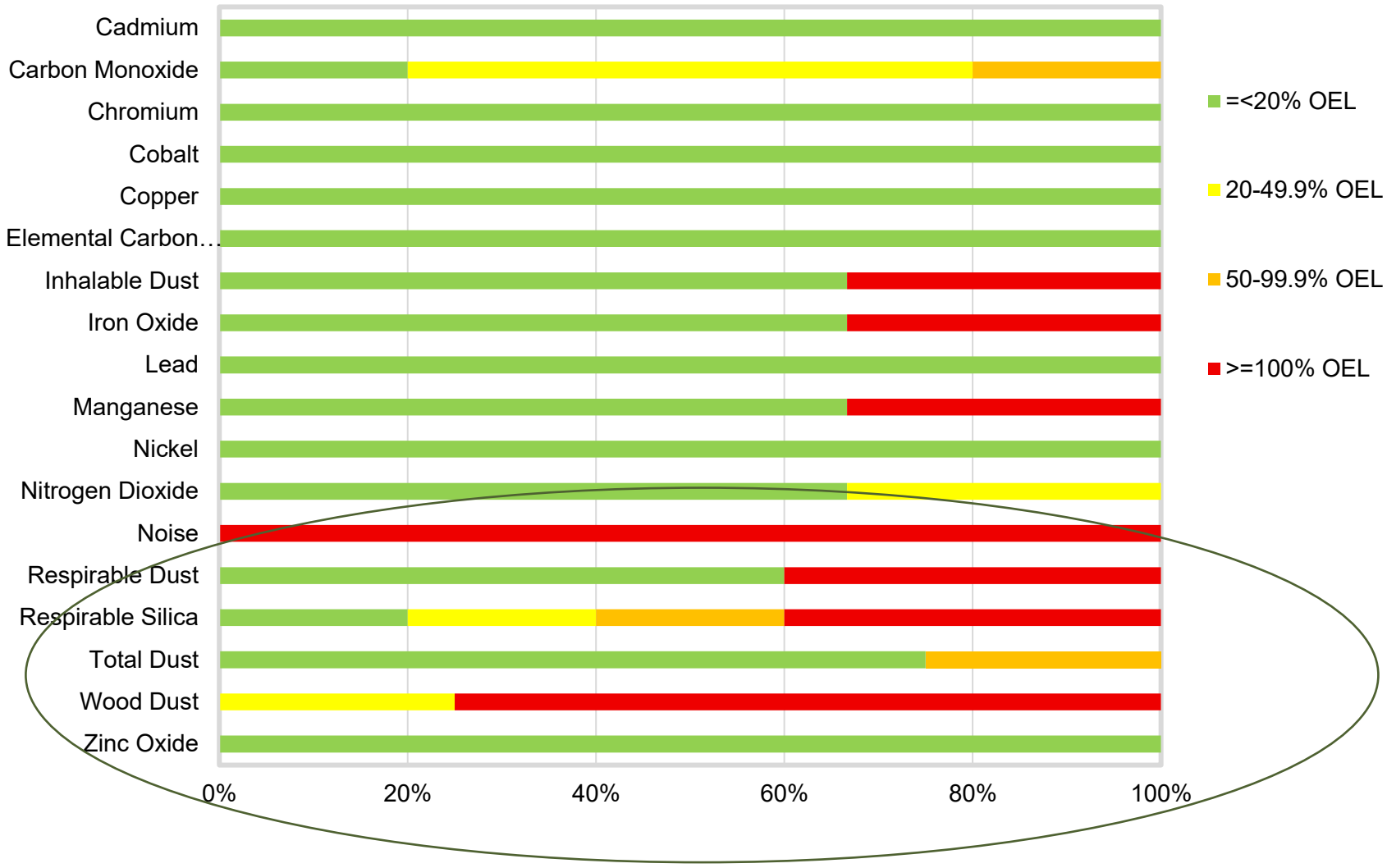


Interim Results*

90%

Impact – Self Efficacy

Quantitative Assessment Results



Recipient Highlights

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What's Working Well – Knowledge Gains

Significant Improvement in Hazard Knowledge

Statistically significant increases across all modules

IH Fundamentals	Diesel	Noise	Silica	Wood Dust

Post-training, 63-81% of workers scored **90-100%** on hazard-specific modules vs. 0-14% pre-training

What's Working Well
Self efficacy gains

Confidence increased across all shifts

Strong gains in ability to:

- Use risk matrices
- Conduct sampling
- Interpret OELs
- Select appropriate PPE
- Recommend control improvements

Overall, 90% increase in self efficacy

What's Working Well
Early workplace changes

Implementation already underway

- Hazard control plans being drafted
- At one workplace, a trainee is proactively identifying hazards and is testing exposure levels in new locations within the workplace, in addition to the work location covered as part of the training.
- At a second workplace, management has upgraded the air filtration system, based on the assessment as part of the WSN program, to reduce worker exposure risk.

Testimonials

“This work made a meaningful difference by providing accurate, real-world data on workplace dust exposure.”

“The experience enhanced my understanding of industrial hygiene practices and emphasized the importance of proactive monitoring in safeguarding worker health and ensuring a safe work environment.”

“The findings helped determine whether exposure levels were within safe limits and identified areas where improvements or additional controls might be needed.”

Changes and Opportunities for Improvement

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Challenges to Achieve Scale

- Current capacity and approach is a bottleneck to scalability
- Reach under current competency model may also be ‘too much at once’ for some – parsed out refinement required
- Geography, distance – lots of travel
- Aligning client schedule and WSN schedule to continue project progression

Lessons Learned

1. The training we have delivered is effective
   a) Instructor-led training allowed for feedback and refinements
2. Real-world scenarios involve turnover
   a) Approx. 50% turnover of trainees at participating sites
3. To achieve scale, we have to re-think how we deliver the training we developed
4. We want to have impact at each company we serve, and we want to collect data measuring whether we are having that impact or not.
5. A cost-effective solution that reaches more companies requires a lower-touch per firm

2026 Improvements

Testing scalability and measuring success

Key Improvements for Year 2 Implementation:

- Standardized e-learning training and survey protocols for each intervention type
- One pulse survey (instead of two) to help achieve scale while still measuring progress
- Expanding use of online tools (from data collection to training delivery) to increase accessibility, consistency and data sharing
- Maintaining WSN staffing levels while expanding our reach
- Lean into trialed and tested model to achieve scale

Research Questions for Year 2

1. **Impact of Maturity-Based Competency Standard**

   Is a standardized, maturity-based competency framework in occupational hazard management effective in enabling a workplace resource to identify and assess illness hazards and determine when controls are needed?

2. **Control Implementation and Organizational Readiness**

   Are informed occupational hazard controls implemented in the workplace, and what factors support or hinder their adoption?

3. **Monitoring as a control effectiveness assessment tool**

   What exposure reduction results from engineering, isolation, substitution, administrative, and PPE controls, and does periodic monitoring ensure their ongoing effectiveness?

Research Questions for Year 2

4. **Self Efficacy**

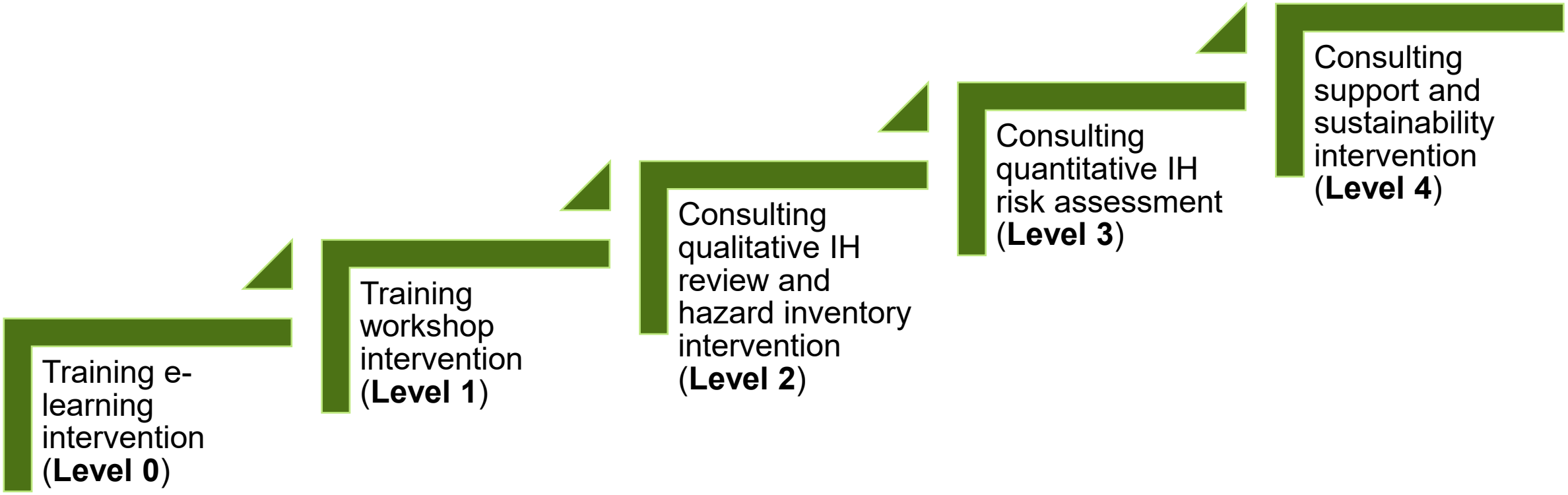
   How does each intervention maturity level affect worker protection from occupational health hazards, and is one more effective than others?

5. **Scalability and Accessibility**

   How scalable is each intervention level relative to its impact, and does removing financial barriers increase uptake for addressing occupational health hazards?

Levels of Intervention: Year 2

Multi-tiered, graduated maturity/intervention model



Intervention/ Support Type	Intervention Details	Awareness: Low Complexity	Level 1: Low/Medium Complexity	Level 2: Medium/High Complexity	Level 3: High Complexity
***Maturity**	Stage of advancement the firm is at regarding Health and Safety	Low	Low-Medium	Medium-High	High
****Reach**	*Estimated # of firms/ estimated # of individual participants*	50/75	14/20	14/20	10/15
Training	**E-Learning/LMS:** increase knowledge through low touch self-serve training. Base level knowledge prior to attending hands-on workshop.	☑	☑	☑	☑
Training	**Workshop:** geographically based (multiday), hands-on skills development building on knowledge component to allow participants to work with expert, ask questions, touch, feel, use equipment, assessment tools etc.		☑	☑	☑
Consulting	**Hazard inventory:** supported by specialist, mentoring approach. Firms who complete the prior two stages can receive WSN assistance to conduct a hazard inventory and receive mentoring on how to complete this and create a complete risk registry framework for occupational health hazards.			☑	☑
Consulting	**Risk assessment:** support by specialist, mentoring and coaching field assessments and measurement, and control recommendations to help mitigate hazard. Potential for reassessment if controls are implemented to assess post control state.			☑	☑
Consulting	**Support & Sustainability:** Expertise and equipment support from WSN for firms that have demonstrated self sufficiency and make require high level assistance to address occupational health hazards by removing financial barriers, logistics issues, or requiring guidance and expert interpretation.				☑

☑ **Engaged in intervention**

☑ **Potential to be engaged in intervention**

Year 2 (2026)

Maturity-based engagement framework

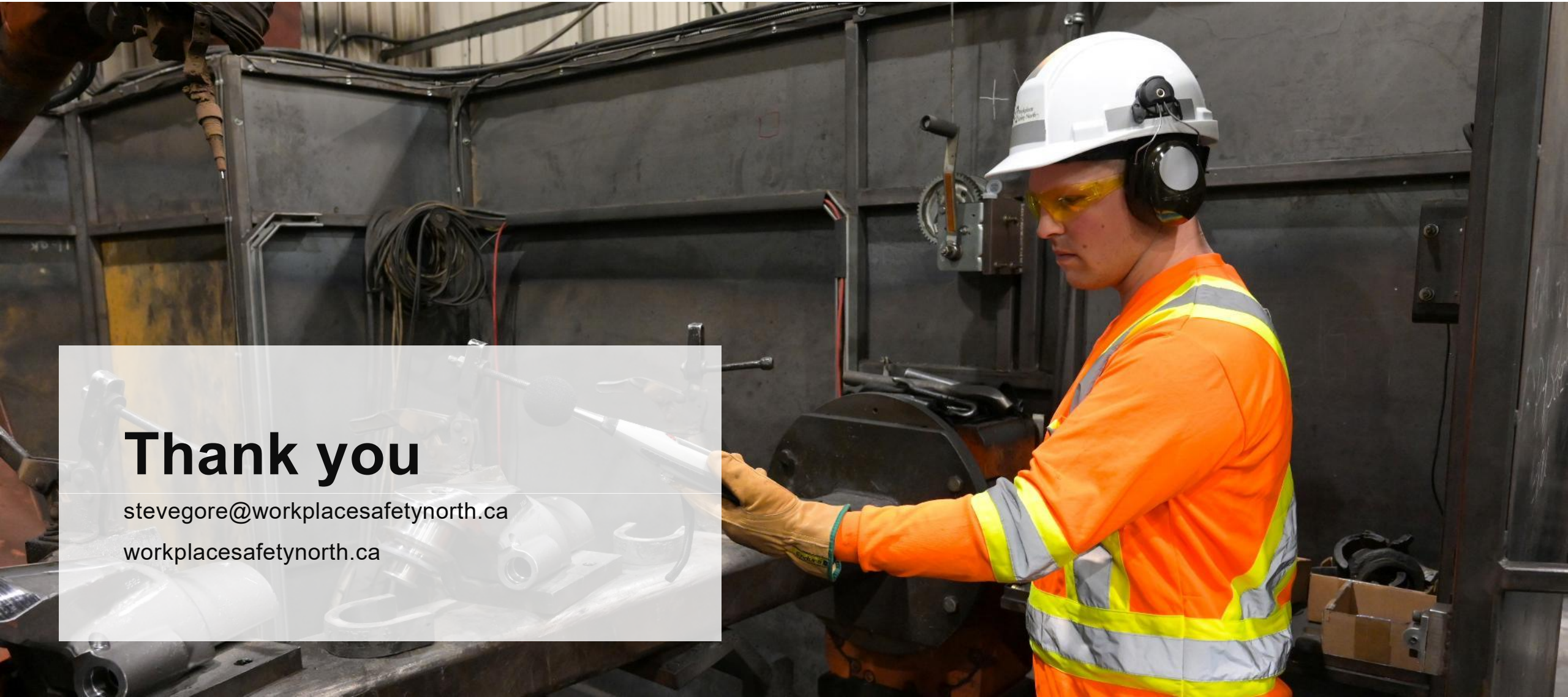
Why This is Important…

- Directly works to address the high rates of occupational illnesses in Ontario's Natural Resources sectors (potentially beyond), reducing risks for workers and associated compensation costs.
- By developing a scalable competency framework, the project increases competent capacity and equips workplaces with skilled personnel to effectively address occupational health hazards.
- The initiative supports compliance and fosters structured and sustainable prevention practices through hazard identification, risk assessment (monitoring, etc.), hazard control and control effectiveness assurance.
    - Reduces harm to workers
    - Lowers claims and long-term liabilities
    - Contributes to a healthier workforce
    - Enables a more resilient workers' compensation system.

Looking Ahead

Scaling and system impact

- Year 1 learnings inform Year 2 approach
- Expand reach
- Standardization to build on our skills and customized abilities in serving our clients as a reliable and trusted advisor
- Greater impact is possible by leveraging support from multiple stakeholders within Ontario’s OHS system
- Leverage Ministerial ‘modular training standards’ approach



Thank you

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