

ARC INDUSTRIAL TRANSFORMATION TRAINING CENTRE

AI-Native Water Systems

The industry that learns

Building the workforce and evidence base for self-evolving water infrastructure

Layer 5 – Regulatory Assurance
Lawful & accountable decisions to protect customers & environments?



Legislation, licenses, public health, environmental standards, risk controls, independent review, accountability

Layer 4 – Management Decisions
Given everything we observe and know, what should we do next?



Dashboard, alarms, communicate, coordinate, judgement, recommendation, approval, scheduling, implementation

Layer 3 – Water Knowledge
What does the organization already know?



Data, models, documents, standards, past decisions, procedures, empirical knowledge, lessons learned ...

Layer 2 – Specialist Intelligence
What does this info tell us?

Lots of AI tools

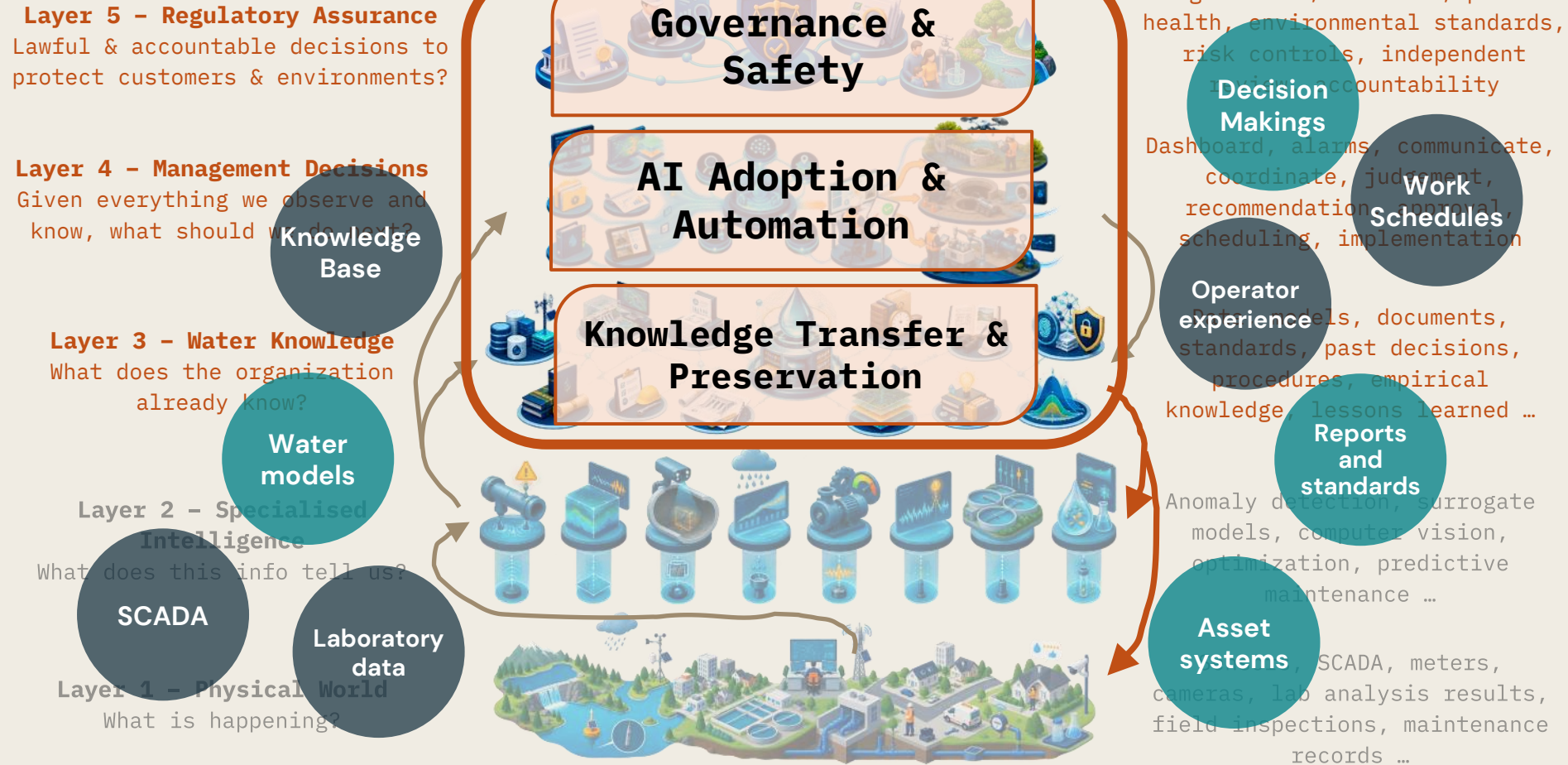


Anomaly detection, surrogate models, computer vision, optimization, predictive maintenance ...

Layer 1 – Physical World
What is happening?



Assets, Sensors, SCADA, meters, cameras, lab analysis results, field inspections, maintenance records ...



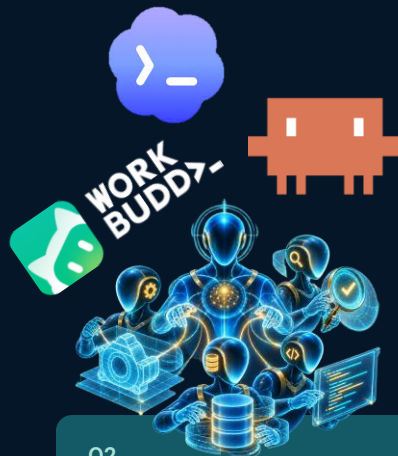
A simple map of AI capability



01

LLM

Reads, explains
and generates



02

Agent

Pursues a goal
with multiple tools
(model, code,
visualisation, report)



03

Physical AI

Learns through
sensing, testing
and action – in a
closed feedback
look



04

Self-evolving water system

People, AI, models and
physical assets
continuously learn from
evidence, with human
oversight and governance

*Every operation, incident
and experiment improves
the next decision*

05

Can Water Systems Design and Operates by *Themselves*?

5



Beyond Automation – A real *self-evolving* ecosystem ⁶



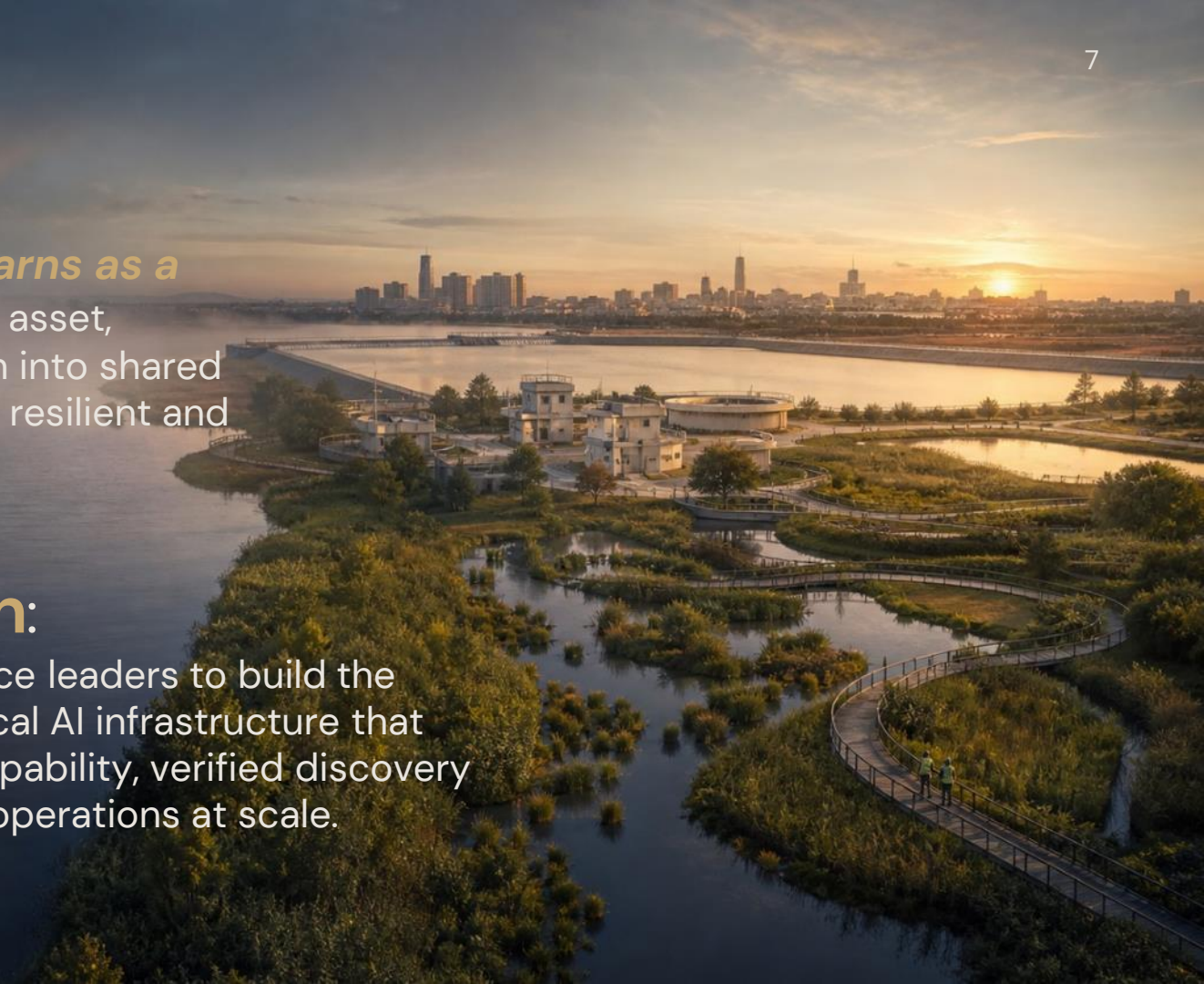
Significantly lower energy cost. Lower emissions.
New designs. Safer decisions. Systems that learn
from every asset, experiment and operation.

Our 2032 **Vision:**

A water industry that ***learns as a system*** – turning every asset, experiment and decision into shared intelligence for a secure, resilient and evolving water future.

Our 2032 **Mission:**

To train water-intelligence leaders to build the trusted Agentic & Physical AI infrastructure that turns AI into adopted capability, verified discovery and safely coordinated operations at scale.



Build the intelligence layer water has never had.



Workforce capability is the mainline



01

UNDERSTAND

Shared language, limitations and risk

02

ADOPT

Guided practice on real tools and workflows

03

APPLY

Partner challenges tested against evidence

04

LEAD

Scale capability and govern change

Researchers learn the sector. Operators learn AI.

Where AI is at for Water Industry?

YEAR 1 TRAINING 2027-2028



01

LLM

Reads, explains
and generates



02

Agent

Pursues a goal
with multiple tools
(model, code,
visualisation, report)



03

Physical AI

Learns through
sensing, testing
and action – in a
closed feedback
look



04

Self-evolving water system

People, AI, models and
physical assets
continuously learn from
evidence, with human
oversight and governance

*Every operation, incident
and experiment improves
the next decision*

05

Where AI is at for Water Industry?

YEAR 2 TRAINING 28-29



01

LLM

Reads, explains
and generates



02

Agent

Pursues a goal
with multiple tools
(model, code,
visualisation, report)



03

Physical AI

Learns through
sensing, testing
and action – in a
closed feedback
look



04

Self-evolving water system

People, AI, models and
physical assets
continuously learn from
evidence, with human
oversight and governance

*Every operation, incident
and experiment improves
the next decision*

05

Where AI is at for Water Industry?

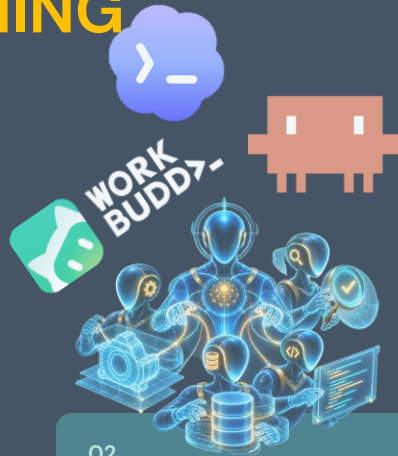
YEAR 3 TRAINING 29-30



01

LLM

Reads, explains
and generates



02

Agent

Pursues a goal
with multiple tools
(model, code,
visualisation, report)



03

Physical AI

Learns through
sensing, testing
and action – in a
closed feedback
look



04

Self-evolving water system

People, AI, models and
physical assets
continuously learn from
evidence, with human
oversight and governance

*Every operation, incident
and experiment improves
the next decision*

05

Where AI is at for Water Industry?

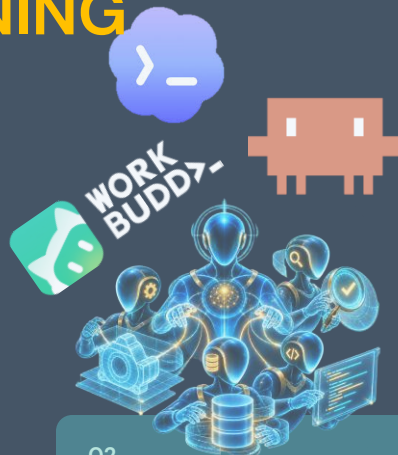
YEAR 4 TRAINING 30-31



01

LLM

Reads, explains
and generates



02

Agent

Pursues a goal
with multiple tools
(model, code,
visualisation, report)



03

Physical AI

Learns through
sensing, testing
and action – in a
closed feedback
look

04

Self-evolving water system

People, AI, models and
physical assets
continuously learn from
evidence, with human
oversight and governance

*Every operation, incident
and experiment improves
the next decision*



Where AI is at for Water Industry?

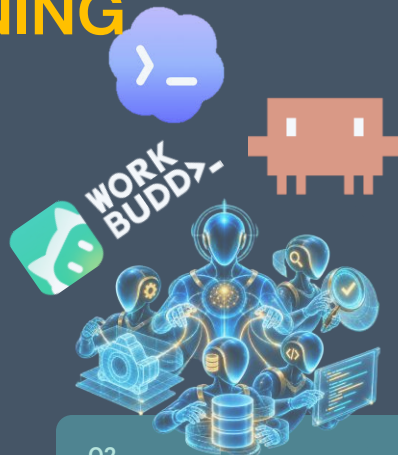
YEAR 5 TRAINING 31-32



01

LLM

Reads, explains
and generates



02

Agent

Pursues a goal
with multiple tools
(model, code,
visualisation, report)



03

Physical AI

Learns through
sensing, testing
and action – in a
closed feedback
look



04

Self-evolving water system

People, AI, models and
physical assets
continuously learn from
evidence, with human
oversight and governance

*Every operation, incident
and experiment improves
the next decision*

05

Partner Structure

understand what the Centre is, what it may cost, and what partners receive.

Up to

A\$10m

ARC funding request

Partner contributions

cash + in-kind

Eligible contributions must match or exceed 50% of the ARC request under the ARC update.

Five-year platform

**training + projects +
evidence**

A pooled program larger than any one partner's contribution.

All figures should be confirmed against final IC27 Grant Guidelines and institutional costing advice before external circulation.

What changes when water systems can learn?

AI becomes useful when it is connected to physics, operating data, human judgement and evidence gates.

Operate smarter

Optimise pumping, aeration, dosing, maintenance and response using real conditions, not fixed habits.

Spend better

Reduce operating cost and improve capital decisions by testing many more options before committing money.

Design differently

Move beyond incremental tuning toward machine-generated options that engineers can test and explain.

Stay accountable

Keep people in control while systems earn more authority through evidence, monitoring and rollback.

Not an autonomous black box: a governed learning system.

The decision window is *now*.

1. Follow up Discussion – Training Centre– **6th Oct**
2. Express your interests by – **16th Oct**
3. Get Letter of Support Ready by – **30th Oct**
4. Application Review – **13th Nov**

ARC lodgement target: 25 November 2026



BEGIN WITH ONE CHALLENGE CHARTER.

Build the self-evolving water industry that
learns — *responsibly, efficiently, together.*

Reliable services. AI-ready Crew. Growing Productivity.
A new Australian industry.