MINING AND MINERALS SECTOR
R&D Roadmap for Technologies in Support of Rehabilitation of Abandoned and Mined-out Area

Done | **Ongoing** | **Not yet Available**

Overall Strategies

Human Recourse
- Training of at least 5 Metallurgical Engineers in bimetallic extraction from AMD
- At least 5 Environmental Engineers involved in projects
- At least 2 Foresters and 1 Soil Scientist involved in mine rehabilitation project
- Immersion abroad of local researchers on advance technologies for rehabilitation technologies of mined-out area/legacy/abandoned mines
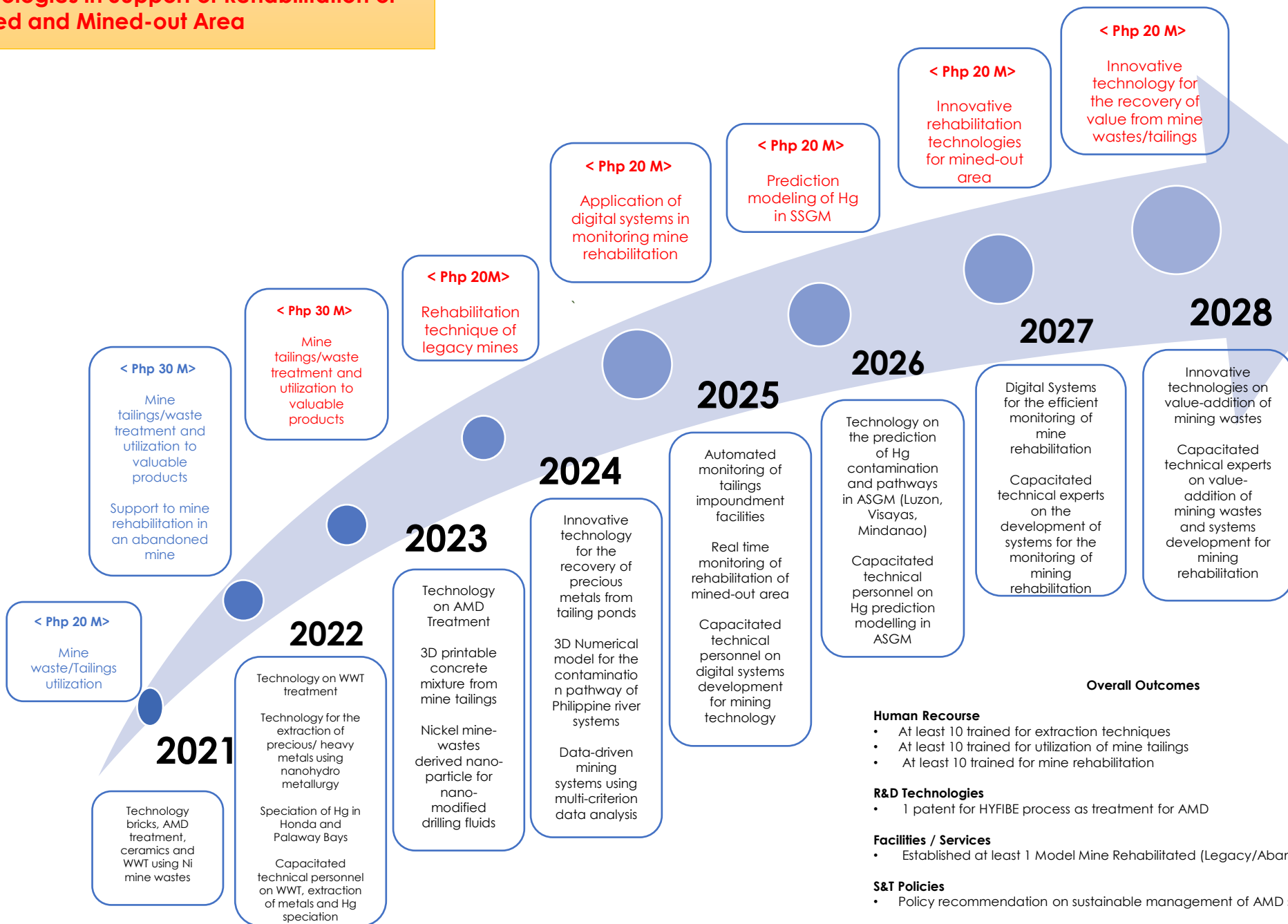- Online workshops with stakeholders and mining companies

R&D Technologies
- Treatment of AMD using Hybrid Ferrite-Bimetallic technique
- Technologies for the remediation and rehabilitation of abandoned and legacy mines
- Monitoring of progressive rehabilitation of existing mining
- Integrated assessment of mercury contamination and mercury speciation in Honda Bay

Facilities / Services
- Establishment of a Model Mine Rehabilitated (Legacy/Abandoned)

S&T Policies
- Creation of policy to encourage mine companies to utilize their mine waste
- Policy recommendation in other alternative way of treating AMD

2021
< Php 20 M>
Mine waste/Tailings utilization

Technology bricks, AMD treatment, ceramics and WWT using Ni mine wastes

2022
< Php 30 M>
Mine tailings/waste treatment and utilization to valuable products

Support to mine rehabilitation in an abandoned mine

Technology on WWT treatment

Technology for the extraction of precious/ heavy metals using nanohydro metallurgy

Speciation of Hg in Honda and Palaway Bays

Capacitated technical personnel on WWT, extraction of metals and Hg speciation

2023
< Php 30 M>
Mine tailings/waste treatment and utilization to valuable products

Technology on AMD Treatment

3D printable concrete mixture from mine tailings

Nickel mine-wastes derived nano-particle for nano-modified drilling fluids

2024
< Php 20M>
Rehabilitation technique of legacy mines

Innovative technology for the recovery of precious metals from tailing ponds

3D Numerical model for the contamination pathway of Philippine river systems

Data-driven mining systems using multi-criterion data analysis

2025
< Php 20 M>
Application of digital systems in monitoring mine rehabilitation

Automated monitoring of tailings impoundment facilities

Real time monitoring of rehabilitation of mined-out area

Capacitated technical personnel on digital systems development for mining technology

2026
< Php 20 M>
Prediction modeling of Hg in SSGM

Technology on the prediction of Hg contamination and pathways in ASGM (Luzon, Visayas, Mindanao)

Capacitated technical personnel on Hg prediction modelling in ASGM

2027
< Php 20 M>
Innovative rehabilitation technologies for mined-out area

Digital Systems for the efficient monitoring of mine rehabilitation

Capacitated technical experts on the development of systems for the monitoring of mining rehabilitation

2028
< Php 20 M>
Innovative technology for the recovery of value from mine wastes/tailings

Innovative technologies on value-addition of mining wastes

Capacitated technical experts on value-addition of mining wastes and systems development for mining rehabilitation

VISION:
Appropriate technologies to reduce negative environmental impacts and improve mine rehabilitation techniques

Overall Outcomes

Human Recourse
- At least 10 trained for extraction techniques
- At least 10 trained for utilization of mine tailings
- At least 10 trained for mine rehabilitation

R&D Technologies
- 1 patent for HYFIBE process as treatment for AMD

Facilities / Services
- Established at least 1 Model Mine Rehabilitated (Legacy/Abandoned)

S&T Policies
- Policy recommendation on sustainable management of AMD submitted to DENR