



## Phytoremediation for Mercury Contaminated Mine Waste Area in Naboc, Monkayo, Compostela Valley

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### Background of the Study:

#### Study Site:

Purok 5, Naboc, Monkayo, Compostela Valley

- Established in March 2016;
- Located approximately 50 kilometers north of Nabunturan and 15 kilometers from the municipality Monkayo, Compostela Valley.

Being located along the bank of the Naboc River, the study site, which has an average mercury concentration of 89 ppm, is a public land. The area has grown various grass species, shrubs, and a few falcata trees and banana planted by the farmer from the adjacent lot.

The site has been contaminated with mercury which drained from the Diwalwal upland mining area thru canals and creeks reaching Naboc river, which overflow during heavy rains, resulting to the deposition of mercury contaminated mine tails and waste water to the land along the river bank.

The mercury contaminated river also supplies irrigation water to the rice farms in Monkayo, Compostela Valley, resulting to the contamination of the soil in the farmland.

### Purpose of the Study:

To rehabilitate and improve the soil condition of the mercury contaminated area due to mining activities in the upland, the study aims:

1. To determine the ability of the experimental plant species to grow and thrive in mercury contaminated mine waste areas;
2. To determine the level of mercury the test plants can accumulate from the contaminated soil; and
3. To determine the cost of rehabilitating mercury contaminated site on a per hectare basis.

### Materials and Methods:

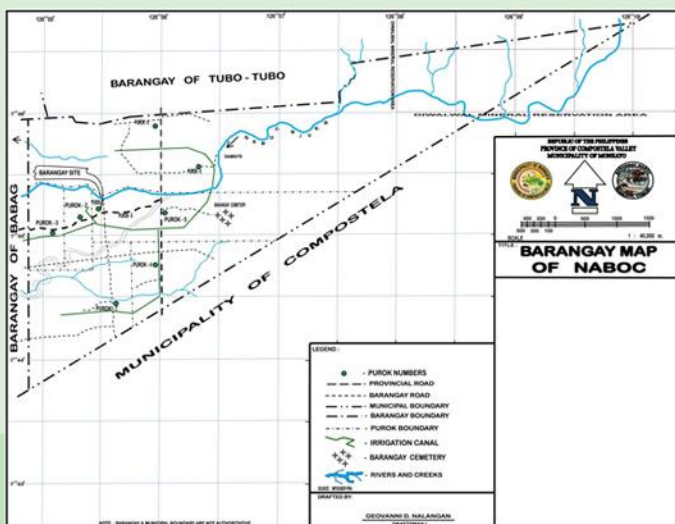
To assess the phytoremediation potential for mercury, trials for four plant species were conducted in the study site. These plants were Hagonoy (*Chromolaena odorata*), Fern (*Asplenium platyneuron*), Makahiya (*Mimosa pudica*), and Talahib (*Saccharum spontaneum*).

Six months after field planting, destructive samplings of the test plants were conducted for the determination of mercury accumulation by the plants under trial.

### Results and Discussion:

Preliminary laboratory test report showed that the test plants had accumulated mercury at different concentration levels.

As presented in the laboratory report, Hagonoy, Fern, Makahiya, and Talahib had accumulated 5.0 ppb, 20.0 ppb, 535 ppb, and 28.80 ppb respectively at six months after planting in the mercury contaminated area. The average survival was observed to be 98% in all the test plants in the study site. Survival was high because the test plants used are the common vegetation in the locality.



Map of Brgy. Naboc, Compostela Valley

**Table 1. Preliminary laboratory test report on mercury accumulation of test plants**

Test Plants	Mercury Accumulation
Hagonoy	5.0 ppb
Fern	20.0 ppb
Mahahiya	535.0 ppb
Talahib	28.8 ppb

**Conclusion:**

The survival of the experimental plants was high (98%) because the experimental plants used were common in the vicinity of the study area.

At six months after planting, the experimental plants, Hagonoy, Fern, Makahiya, and Talahib had absorbed 5.0 ppb, 20.0 ppb, 535.0 ppb, and 28.8 ppb respectively. Makahiya was the highest mercury accumulator among the test plants.

There are two main costs associated with the remediation of mercury contaminated site. These are the material cost and the labor cost. Record of the costs incurred showed that a total of sixty thousand five hundred pesos (P60, 500.00) is needed to partially mitigate the one hectare site with an average mercury contamination level of 89 ppm for a period of six months.

**Makahiya (*Mimosa pudica*)**



*Hagonoy (Chromolaena odorata)*



*Talahib (Saccharum spontaneum)*



*Fern (Asplenium platyneuron)*

Produced and Packaged by:

**Mining and Degraded Areas Rehabilitation  
Research Center (MDARRC)**

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