

```
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
```

```
// Initialize LCD at I2C address 0x27, 16 chars x 2 lines
LiquidCrystal_I2C lcd(0x27, 16, 2);
```

```
const int turbidityPin = A0; // Sensor OUT pin connected to A0
```

```
int sensorValue = 0;
float turbidityNTU = 0;
```

```
void setup() {
  // Start LCD
  lcd.init();
  lcd.backlight();
}
```

```
// Start serial monitor (for debugging)
Serial.begin(9600);
```

```
lcd.setCursor(0, 0);
lcd.print("Turbidity Meter");
delay(2000);
lcd.clear();
}
```

```
void loop() {
  // Read sensor analog value (0-1023)
  sensorValue = analogRead(turbidityPin);
```

```
// Map sensor value to 0-100 "NTU-like" scale
// (You can adjust this scaling depending on calibration)
turbidityNTU = map(sensorValue, 0, 1023,
0, 100);
```

```
// Print to serial monitor
Serial.print("Sensor Value: ");
Serial.print(sensorValue);
Serial.print(" | Turbidity: ");
Serial.println(turbidityNTU);
```

```
// Display on LCD
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Turb: ");
lcd.print(turbidityNTU, 1);
lcd.print(" NTU");
```

```
lcd.setCursor(0, 1);
```

```
// Check water quality range
if (turbidityNTU <= 5) {
  lcd.print("Status: SAFE");
}
else if (turbidityNTU > 5 && turbidityNTU <= 50) {
  lcd.print("Microplastics?");
}
else {
  lcd.print("HEAVY POLLUTION");
}
```

```
delay(1000); // Update every second
}
```