# QMRA Toolkit - Visual Step-by-Step Guide with Interface Screenshots

**Complete Visual Walkthrough with Interface Examples** **NIWA Earth Sciences - September 26, 2025**

## 🎯 **Visual Quick Start - Your First Assessment in 30 Minutes**

### **STEP 1: Launch the Toolkit**

#### **Option A: GUI Interface (Recommended for Beginners)**

┌─────────────────────────────────────────────────────────────────┐  
│ Windows Explorer: qmra\_toolkit folder │  
├─────────────────────────────────────────────────────────────────┤  
│ 📁 config/ 📄 launch\_gui.py │  
│ 📁 data/ 📄 Launch\_QMRA\_GUI.bat ← DOUBLE-CLICK │  
│ 📁 docs/ 📄 README.md │  
│ 📁 examples/ 📄 requirements.txt │  
│ 📁 src/ 📄 treatment\_config.yaml │  
│ 📁 templates/ 📄 wastewater\_treatment.yaml │  
│ 📁 tests/ │  
└─────────────────────────────────────────────────────────────────┘

**What to do:** 1. Navigate to the qmra\_toolkit folder 2. **Double-click** Launch\_QMRA\_GUI.bat 3. Wait for the GUI window to appear (3-5 seconds)

### **STEP 2: GUI Interface Overview**

When the GUI launches, you’ll see this main window:

┌─────────────────────────────────────────────────────────────────────────┐  
│ QMRA Assessment Toolkit - NIWA [\_][□][X]│  
├─────────────────────────────────────────────────────────────────────────┤  
│ File Edit Assessment Reports Help │  
├─────────────────────────────────────────────────────────────────────────┤  
│ │  
│ ┌─── Project Setup ────────────────┐ ┌─── Assessment Parameters ───┐ │  
│ │ │ │ │ │  
│ │ Project Name: [\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_]│ │ Pathogen: [Norovirus ▼] │ │  
│ │ Assessor: [\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_]│ │ Route: [Primary Contact ▼] │ │  
│ │ Date: [2025-09-26\_\_\_\_\_\_\_\_\_\_\_\_\_\_]│ │ Concentration: [1000000\_\_\_] │ │  
│ │ Client: [\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_]│ │ copies/L │ │  
│ │ │ │ │ │  
│ │ Population at Risk: │ │ Exposure Volume: [0.1\_\_\_\_\_] │ │  
│ │ [100000\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_]│ │ L per event │ │  
│ │ │ │ │ │  
│ └──────────────────────────────────┘ │ Frequency: [7\_\_\_\_\_\_\_\_\_\_\_\_\_] │ │  
│ │ events/year │ │  
│ ┌─── Treatment Scenarios ──────────┐ │ │ │  
│ │ │ │ Monte Carlo: [10000\_\_\_\_\_\_\_] │ │  
│ │ Current Treatment: │ │ iterations │ │  
│ │ Type: [Secondary Treatment \_\_\_\_]│ │ │ │  
│ │ LRV Norovirus: [1.0\_\_\_\_\_\_\_\_\_\_\_\_]│ └─────────────────────────────┘ │  
│ │ LRV Campylobacter: [2.0\_\_\_\_\_\_\_\_]│ │  
│ │ LRV Cryptosporidium: [1.5\_\_\_\_\_\_]│ ┌─── Run Assessment ─────────┐ │  
│ │ │ │ │ │  
│ │ Proposed Treatment: │ │ [Load Config File] │ │  
│ │ Type: [Tertiary Treatment \_\_\_\_\_]│ │ [Save Config File] │ │  
│ │ LRV Norovirus: [3.5\_\_\_\_\_\_\_\_\_\_\_\_]│ │ │ │  
│ │ LRV Campylobacter: [4.0\_\_\_\_\_\_\_\_]│ │ [▶ RUN ASSESSMENT] │ │  
│ │ LRV Cryptosporidium: [3.0\_\_\_\_\_\_]│ │ │ │  
│ │ │ │ [Generate Report] │ │  
│ └──────────────────────────────────┘ │ [View Results] │ │  
│ │ │ │  
│ └───────────────────────────┘ │  
│ │  
├─────────────────────────────────────────────────────────────────────────┤  
│ Status: Ready | Progress: [░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░] 0% │  
└─────────────────────────────────────────────────────────────────────────┘

**Key Interface Elements:** - **🎯 Project Setup (Top Left)**: Basic project information - **📊 Assessment Parameters (Top Right)**: Core QMRA settings - **🔧 Treatment Scenarios (Bottom Left)**: Current vs proposed treatment - **▶️ Run Assessment (Bottom Right)**: Action buttons - **📈 Status Bar (Bottom)**: Progress and status messages

### **STEP 3: Fill in Your Assessment Parameters**

#### **3.1 Project Setup Section**

┌─── Project Setup ─────────────────────────────┐  
│ │  
│ Project Name: [Auckland Council WWTP\_\_\_\_\_\_\_]│ ← Enter descriptive name  
│ Assessor: [Your Name Here\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_]│ ← Your name  
│ Date: [2025-09-26\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_]│ ← Auto-filled  
│ Client: [Auckland Council\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_]│ ← Client organization  
│ │  
│ Population at Risk: │  
│ [500000\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_]│ ← Number of people exposed  
│ │  
└───────────────────────────────────────────────┘

**Visual Cues:** - **Green border**: Successfully filled field - **Red border**: Required field missing - **Yellow background**: Field with validation warning

#### **3.2 Assessment Parameters Section**

┌─── Assessment Parameters ─────────────────────┐  
│ │  
│ Pathogen: [Norovirus ▼] │ ← Click dropdown  
│ [▪ Norovirus ] │ Select pathogen  
│ [▪ Campylobacter ] │  
│ [▪ Cryptosporidium ] │  
│ [▪ E. coli ] │  
│ │  
│ Route: [Primary Contact ▼] │ ← Exposure route  
│ [▪ Primary Contact ] │  
│ [▪ Shellfish Consumption ] │  
│ [▪ Drinking Water ] │  
│ [▪ Aerosol Inhalation ] │  
│ │  
│ Concentration: [1000000\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_] │ ← Pathogen concentration  
│ copies/L │ (copies/L or CFU/L)  
│ │  
│ Exposure Volume: [0.1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_] │ ← Volume per exposure  
│ L per event │ (Liters)  
│ │  
│ Frequency: [7\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_] │ ← Events per year  
│ events/year │  
│ │  
│ Monte Carlo: [10000\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_] │ ← Simulation iterations  
│ iterations │ (recommended: 10,000)  
│ │  
└───────────────────────────────────────────────┘

### **STEP 4: Set Up Treatment Scenarios**

#### **4.1 Current Treatment Configuration**

┌─── Treatment Scenarios ───────────────────────────┐  
│ │  
│ Current Treatment: │  
│ Type: [Secondary Treatment\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_] │ ← Treatment type  
│ │  
│ Log Reduction Values (LRV): │  
│ ┌─────────────────────────────────────────────┐ │  
│ │ Pathogen │ LRV │ Effectiveness │ │  
│ ├─────────────────────────────────────────────┤ │  
│ │ Norovirus │ [1.0\_] │ 90.0% │ │ ← 1 log = 90% removal  
│ │ Campylobacter │ [2.0\_] │ 99.0% │ │ ← 2 log = 99% removal  
│ │ Cryptosporidium │ [1.5\_] │ 96.8% │ │ ← 1.5 log = 96.8% removal  
│ └─────────────────────────────────────────────┘ │  
│ │  
│ Proposed Treatment: │  
│ Type: [Tertiary Treatment\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_] │ ← Upgraded treatment  
│ │  
│ ┌─────────────────────────────────────────────┐ │  
│ │ Pathogen │ LRV │ Effectiveness │ │  
│ ├─────────────────────────────────────────────┤ │  
│ │ Norovirus │ [3.5\_] │ 99.97% │ │ ← 3.5 log = 99.97% removal  
│ │ Campylobacter │ [4.0\_] │ 99.99% │ │ ← 4.0 log = 99.99% removal  
│ │ Cryptosporidium │ [3.0\_] │ 99.90% │ │ ← 3.0 log = 99.90% removal  
│ └─────────────────────────────────────────────┘ │  
│ │  
│ Dilution Factor: [100\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_] │ ← Receiving water dilution  
│ │  
└───────────────────────────────────────────────────┘

**Important Notes:** - **LRV = Log Reduction Value**: Each log removes 90% of pathogens - **Higher LRV = Better Treatment**: 3 logs = 99.9% removal - **Dilution Factor**: How much receiving water dilutes the effluent

### **STEP 5: Run the Assessment**

#### **5.1 Pre-Run Validation**

┌─── Run Assessment ─────────────────┐  
│ │  
│ [Load Config File] │ ← Load saved settings  
│ [Save Config File] │ ← Save current settings  
│ │  
│ Validation Status: │  
│ ✅ Project information complete │ ← All required fields filled  
│ ✅ Assessment parameters valid │ ← Parameters in valid ranges  
│ ✅ Treatment scenarios defined │ ← Both scenarios configured  
│ ⚠️ High pathogen concentration │ ← Warning about assumptions  
│ │  
│ [▶ RUN ASSESSMENT] │ ← Click to start analysis  
│ │  
│ [Generate Report] │ ← Available after run  
│ [View Results] │ ← Available after run  
│ │  
└────────────────────────────────────┘

#### **5.2 Assessment Progress**

┌─────────────────────────────────────────────────────────────────────────┐  
│ QMRA Assessment Toolkit - NIWA [\_][□][X] │  
├─────────────────────────────────────────────────────────────────────────┤  
│ │  
│ 🔄 ASSESSMENT IN PROGRESS │  
│ │  
│ Current Step: Monte Carlo Simulation │  
│ Iteration: 7,432 of 10,000 (74.3% complete) │  
│ │  
│ Progress: [████████████████████░░░░░░░░░░] 74% │  
│ │  
│ ┌─── Current Analysis Status ─────────────────────────────────────┐ │  
│ │ │ │  
│ │ ✅ Pathogen database loaded │ │  
│ │ ✅ Exposure scenarios configured │ │  
│ │ ✅ Dose-response models initialized │ │  
│ │ 🔄 Monte Carlo simulation running... │ │  
│ │ ⏳ Risk characterization pending │ │  
│ │ ⏳ Report generation pending │ │  
│ │ │ │  
│ └─────────────────────────────────────────────────────────────────┘ │  
│ │  
│ Estimated time remaining: 2 minutes │  
│ │  
├─────────────────────────────────────────────────────────────────────────┤  
│ Status: Running Monte Carlo simulation... | Progress: 74% │  
└─────────────────────────────────────────────────────────────────────────┘

### **STEP 6: View and Interpret Results**

#### **6.1 Results Summary Window**

┌─────────────────────────────────────────────────────────────────────────┐  
│ Assessment Results - Auckland Council WWTP [\_][□][X] │  
├─────────────────────────────────────────────────────────────────────────┤  
│ │  
│ ┌─── Risk Assessment Summary ─────────────────────────────────────┐ │  
│ │ │ │  
│ │ Assessment: Auckland Council WWTP Tertiary Treatment │ │  
│ │ Date: September 26, 2025 │ │  
│ │ Population: 500,000 people │ │  
│ │ │ │  
│ │ ┌─────────────────────────────────────────────────────────┐ │ │  
│ │ │ PATHOGEN RISK COMPARISON │ │ │  
│ │ ├─────────────────────────────────────────────────────────┤ │ │  
│ │ │ │ Current │ Proposed │ Status │ │ │  
│ │ │ Pathogen │ Risk │ Risk │ │ │ │  
│ │ ├─────────────────────────────────────────────────────────┤ │ │  
│ │ │ 🦠 Norovirus │ 9.83e-01 │ 5.56e-01 │ ❌ High Risk │ │ │  
│ │ │ 🧬 Campylobacter │ 1.30e-01 │ 1.43e-03 │ 🔶 Moderate │ │ │  
│ │ │ 🔬 Cryptosporidium │ 3.15e-03 │ 1.22e-05 │ ✅ Low Risk │ │ │  
│ │ └─────────────────────────────────────────────────────────┘ │ │  
│ │ │ │  
│ │ PUBLIC HEALTH IMPACT: │ │  
│ │ • Norovirus cases prevented: 213,445 per year │ │  
│ │ • Campylobacter cases prevented: 64,065 per year │ │  
│ │ • Total illness reduction: 277,510 cases per year │ │  
│ │ │ │  
│ └─────────────────────────────────────────────────────────────────┘ │  
│ │  
│ ┌─── Regulatory Compliance ───────────────────────────────────────┐ │  
│ │ │ │  
│ │ New Zealand Guidelines (Annual Risk ≤ 1e-6): │ │  
│ │ │ │  
│ │ Current Treatment: │ │  
│ │ ❌ NON-COMPLIANT - Risk exceeds guidelines │ │  
│ │ │ │  
│ │ Proposed Treatment: │ │  
│ │ 🔶 IMPROVED - Significant risk reduction achieved │ │  
│ │ ⚠️ Norovirus still above compliance threshold │ │  
│ │ │ │  
│ │ Recommendation: Proceed with tertiary treatment upgrade │ │  
│ │ │ │  
│ └─────────────────────────────────────────────────────────────────┘ │  
│ │  
│ [📊 View Detailed Plots] [📄 Generate Report] [💾 Export Data] [🔄 New]│  
│ │  
├─────────────────────────────────────────────────────────────────────────┤  
│ Status: Assessment completed successfully │  
└─────────────────────────────────────────────────────────────────────────┘

### **STEP 7: Visual Results and Plots**

#### **7.1 Risk Comparison Plot**

┌─────────────────────────────────────────────────────────────────────────┐  
│ Risk Analysis Plots [\_][□][X] │  
├─────────────────────────────────────────────────────────────────────────┤  
│ │  
│ ┌─── Pathogen Risk Comparison ─────────────────────────────────────┐ │  
│ │ │ │  
│ │ Annual Illness Risk by Pathogen │ │  
│ │ │ │  
│ │ 1e+0 ┐ │ │  
│ │ │ ████ │ │  
│ │ │ ████ Current │ │  
│ │ 1e-1 ┤ ████ ▓▓▓▓ │ │  
│ │ │ ████ ▓▓▓▓ Proposed │ │  
│ │ │ ████ ▓▓▓▓ │ │  
│ │ 1e-2 ┤ ████ ▓▓▓▓ ████ │ │  
│ │ │ ████ ▓▓▓▓ ████ │ │  
│ │ ↑ │ ████ ▓▓▓▓ ████ ░░░░ │ │  
│ │ 1e-3 ┤ ████ ▓▓▓▓ ████ ░░░░ │ │  
│ │ │ │ ████ ▓▓▓▓ ████ ░░░░ │ │  
│ │ 1e-4 ┤ ████ ▓▓▓▓ ████ ░░░░ │ │  
│ │ │ ████ ▓▓▓▓ ████ ░░░░ │ │  
│ │ Risk │ ████ ▓▓▓▓ ████ ░░░░ │ │  
│ │ 1e-5 ┤ ████ ▓▓▓▓ ████ ░░░░ │ │  
│ │ │ ████ ▓▓▓▓ ████ ░░░░ │ │  
│ │ │ │ ████ ▓▓▓▓ ████ ░░░░ │ │  
│ │ 1e-6 ┼──██████▓▓▓▓████░░░░────── NZ Guideline (1e-6) │ │  
│ │ │ │ │  
│ │ 1e-7 ┘ Noro Camp Crypto │ │  
│ │ │ │  
│ │ Legend: ████ Current Treatment ▓▓▓▓ Proposed Treatment │ │  
│ │ │ │  
│ └──────────────────────────────────────────────────────────────────┘ │  
│ │  
│ ┌─── Treatment Effectiveness ──────────────────────────────────────┐ │  
│ │ │ │  
│ │ Cases Prevented Per Year (Population: 500,000) │ │  
│ │ │ │  
│ │ 300,000 ┐ │ │  
│ │ │ ████████████████████ 213,445 │ │  
│ │ 250,000 ┤ ████████████████████ │ │  
│ │ │ ████████████████████ │ │  
│ │ 200,000 ┤ ████████████████████ │ │  
│ │ │ ████████████████████ │ │  
│ │ 150,000 ┤ ████████████████████ │ │  
│ │ │ ████████████████████ │ │  
│ │ 100,000 ┤ ████████████████████ ██████████ 64,065 │ │  
│ │ │ ████████████████████ ██████████ │ │  
│ │ 50,000 ┤ ████████████████████ ██████████ │ │  
│ │ │ ████████████████████ ██████████ █ <100 │ │  
│ │ 0 ┘ Norovirus Campylobacter Cryptosporidium │ │  
│ │ │ │  
│ └──────────────────────────────────────────────────────────────────┘ │  
│ │  
│ [💾 Save Plots] [📧 Email Results] [🖨️ Print] [📋 Copy Data] │  
│ │  
├─────────────────────────────────────────────────────────────────────────┤  
│ Status: Plots generated successfully │  
└─────────────────────────────────────────────────────────────────────────┘

### **STEP 8: Generate Professional Report**

#### **8.1 Report Generation Dialog**

┌─────────────────────────────────────────────────────────────────────────┐  
│ Generate Assessment Report [\_][□][X]│  
├─────────────────────────────────────────────────────────────────────────┤  
│ │  
│ ┌─── Report Templates ──────────────────────────────────────────────┐ │  
│ │ │ │  
│ │ ◉ Executive Summary Report │ │  
│ │ • 2-3 page summary for decision-makers │ │  
│ │ • Key findings and recommendations │ │  
│ │ • Risk comparison charts │ │  
│ │ │ │  
│ │ ○ Technical Assessment Report │ │  
│ │ • Detailed 15-20 page technical report │ │  
│ │ • Complete methodology and calculations │ │  
│ │ • Peer review ready │ │  
│ │ │ │  
│ │ ○ Regulatory Compliance Report │ │  
│ │ • Focused on compliance status │ │  
│ │ • Regulatory framework alignment │ │  
│ │ • Submission ready format │ │  
│ │ │ │  
│ └───────────────────────────────────────────────────────────────────┘ │  
│ │  
│ ┌─── Output Options ────────────────────────────────────────────────┐ │  
│ │ │ │  
│ │ Report Format: │ │  
│ │ ☑️ PDF (Recommended) ☑️ Word Document ☐ HTML │ │  
│ │ │ │  
│ │ Include: │ │  
│ │ ☑️ Risk comparison plots ☑️ Data tables │ │  
│ │ ☑️ Uncertainty analysis ☑️ Methodology section │ │  
│ │ ☑️ Quality assurance info ☑️ Literature references │ │  
│ │ │ │  
│ │ Output Location: │ │  
│ │ [C:\...\NZ\_Consultancy\_Project\_2025\reports\] [Browse...] │ │  
│ │ │ │  
│ └───────────────────────────────────────────────────────────────────┘ │  
│ │  
│ ┌─── Report Preview ────────────────────────────────────────────────┐ │  
│ │ │ │  
│ │ Estimated report length: 3 pages │ │  
│ │ Includes: 2 charts, 1 data table, executive summary │ │  
│ │ Processing time: ~30 seconds │ │  
│ │ │ │  
│ │ Report will include: │ │  
│ │ • Project overview and parameters │ │  
│ │ • Risk assessment results │ │  
│ │ • Treatment scenario comparison │ │  
│ │ • Regulatory compliance status │ │  
│ │ • Recommendations and next steps │ │  
│ │ │ │  
│ └───────────────────────────────────────────────────────────────────┘ │  
│ │  
│ [📄 Generate Report] [👁️ Preview] [❌ Cancel] │  
│ │  
├─────────────────────────────────────────────────────────────────────────┤  
│ Status: Ready to generate report │  
└─────────────────────────────────────────────────────────────────────────┘

## 🚨 **Visual Troubleshooting Guide**

### **Common Issue 1: GUI Won’t Start**

┌─────────────────────────────────────────────────────────────┐  
│ Command Prompt Error [\_][□][X]│  
├─────────────────────────────────────────────────────────────┤  
│ │  
│ C:\...\qmra\_toolkit> python launch\_gui.py │  
│ │  
│ Error importing GUI modules: No module named 'tkinter' │  
│ Please ensure all dependencies are installed: │  
│ pip install -r requirements.txt │  
│ │  
│ SOLUTION: │  
│ 1. Check Python version: python --version │  
│ (Should be 3.8 or higher) │  
│ 2. Install requirements: pip install -r requirements.txt │  
│ 3. Try again: python launch\_gui.py │  
│ │  
└─────────────────────────────────────────────────────────────┘

### **Common Issue 2: Invalid Parameters**

┌─────────────────────────────────────────────────────────────┐  
│ Parameter Validation Error [\_][□][X]│  
├─────────────────────────────────────────────────────────────┤  
│ │  
│ ⚠️ VALIDATION ERRORS DETECTED │  
│ │  
│ The following parameters need attention: │  
│ │  
│ ❌ Pathogen concentration too high (>1e8) │  
│ Current: 1e10 copies/L │  
│ Typical range: 1e3 - 1e7 copies/L │  
│ → Check your data source │  
│ │  
│ ❌ LRV values inconsistent │  
│ Norovirus LRV > Cryptosporidium LRV │  
│ → Verify treatment effectiveness data │  
│ │  
│ ⚠️ Population at risk very high │  
│ Current: 10,000,000 people │  
│ → Confirm this is correct for your scenario │  
│ │  
│ [Fix Parameters] [Continue Anyway] [Load Example] │  
│ │  
└─────────────────────────────────────────────────────────────┘

## 📊 **Understanding Visual Results**

### **Risk Level Color Coding**

┌─── Risk Interpretation Legend ────────────────────────────────────┐  
│ │  
│ ✅ GREEN (Compliant): Annual risk ≤ 1e-6 │  
│ • Meets New Zealand guidelines │  
│ • No action required │  
│ • Safe for public health │  
│ │  
│ 🔶 YELLOW (Moderate): 1e-6 < Annual risk ≤ 1e-2 │  
│ • Above guidelines but manageable │  
│ • Consider treatment improvements │  
│ • Monitor closely │  
│ │  
│ ❌ RED (High Risk): Annual risk > 1e-2 │  
│ • Significant public health concern │  
│ • Treatment upgrade required │  
│ • Not suitable for current use │  
│ │  
└───────────────────────────────────────────────────────────────────┘

### **Treatment Effectiveness Scale**

┌─── Log Reduction Value (LRV) Reference ──────────────────────────┐  
│ │  
│ LRV 1.0 = 90% removal ████████░░ 90% │  
│ LRV 2.0 = 99% removal █████████░ 99% │  
│ LRV 3.0 = 99.9% removal ██████████ 99.9% │  
│ LRV 4.0 = 99.99% removal ██████████ 99.99% │  
│ │  
│ Higher LRV = Better Treatment Performance │  
│ Typical ranges: │  
│ • Primary treatment: 0.5-1.0 LRV │  
│ • Secondary treatment: 1.0-2.5 LRV │  
│ • Tertiary treatment: 2.5-4.0+ LRV │  
│ │  
└──────────────────────────────────────────────────────────────────┘

## 📋 **Visual Checklist for Quality Assurance**

### **Before Running Assessment**

┌─── Pre-Assessment Checklist ─────────────────────────────────────┐  
│ │  
│ □ Project name is descriptive and unique │  
│ □ Population at risk is realistic (check census data) │  
│ □ Pathogen concentrations from reliable source │  
│ □ Treatment LRVs match technology specifications │  
│ □ Exposure parameters appropriate for scenario │  
│ □ Monte Carlo iterations ≥ 10,000 │  
│ □ All required fields show green validation │  
│ │  
│ ✅ Ready to run assessment │  
│ │  
└──────────────────────────────────────────────────────────────────┘

### **After Getting Results**

┌─── Post-Assessment Validation ───────────────────────────────────┐  
│ │  
│ □ Risk values are reasonable (not exactly 0 or 1) │  
│ □ Proposed treatment shows improvement over current │  
│ □ Results consistent with similar studies │  
│ □ Confidence intervals make sense │  
│ □ Plots display without errors │  
│ □ Report generation successful │  
│ │  
│ ✅ Results validated and ready for reporting │  
│ │  
└──────────────────────────────────────────────────────────────────┘

**This visual guide shows you exactly what to expect at each step of using the QMRA toolkit, with detailed interface mockups, troubleshooting screens, and result interpretation guides.**

*Visual Step-by-Step Guide with Interface Examples* *NIWA Earth Sciences QMRA Team - September 26, 2025*