AG8 - Site Field Study

Catchment Threat Field Study 5A3 Issues in Australian Environments - Water Management	Curriculum Links
Pre-field work – Estimated time 2 hours **1. Choose Site for Field Study** ▪ From the priority list of ecological threats to health of your sub-catchment that you identified in Activity 1 – Catchment Walk, choose one threat for more detailed field investigation. ▪ Look at your catchment map and choose an appropriate site to conduct a more detailed investigation of the issue. For example if you choose sewage pollution, you may target wet weather and dry weather water quality testing. If you choose impacts of a particular landuse (eg residential or industrial) you may select sites above and below the landuse zone. ▪ For more information refer Streamwatch Manual pages 17 – 25. **2. Design Field Study** What do you need to prepare before you conduct your field study? What equipment do you need on your field study? What permission do you need? What are the safety issues that you need to consider? How will you share the responsibilities for collecting and recording information within each class group?	**Outcomes** 5.1 identifies, gathers and evaluates geographical information 5.2 analyses, organises and synthesises geographical information **Fieldwork task** Develop a research action plan
3. Conduct Field Study (estimated time 2 hours) **Caution:** Assume all waterways are polluted with sewage and toxic substances. Students should wear water proof gloves and take precautions to prevent the transmission of diseases such as hepatitis by carefully washing hands after testing. 1. To conduct tests, students should follow the instructions set out in the kit. For background information and instructions on conducting water quality tests, refer to: ▪ Water Quality Information Sheet ▪ UPRCT schools water quality testing kit ▪ NSW EPA Stormwater Teaching Guide – Section 4: www.epa.nsw.gov.au/stormwater/hsieteachingguide/investigatex.htm for background to water quality testing and www.epa.nse.gov.au/stormwater/hsieteachingguide/stg5activity41.htm for background on interpreting the tests. ▪ Streamwatch Manual (page 27 – 80) 2. Collate data - use Table 1 to interpret data and compare with ANZECC Guidelines. (www.ea.gov.au - search for water quality guidelines) 3. Present test results in a suitable table.	**Outcomes** 5.1 identifies, gathers and evaluates geographical information 5.2 analyses, organises and synthesises geographical information **Fieldwork task** - develop a research action plan - gather and process relevant data

Interpret Results a. Students can use Table 1: Interpreting Water Quality Data and the Water Pollution Information Sheet to interpret the results of their water quality investigation. b. Have students work in groups to prepare a mind map of potential sources of the pollution threats that they have identified through their investigations. c. Students prepare a report on the results of their investigations and present a short to the class.	**Outcomes** 5.1 identifies, gathers and evaluates geographical information 5.2 analyses, organises and synthesises geographical information 5.3 selects and uses appropriate written, oral and graphic forms to communicate geographical information **Fieldwork task** - evaluate alternative solutions regarding management of the issue

5. Develop an action plan a. Brainstorm strategies that could be used to address the potential sources of pollution identified b. Evaluate these alternative solutions c. Students choose one strategy from the proposed solutions list that they can undertake themselves. d. As a class group prepare a list of actions that need to be taken to implement the strategy – use Table 2 as a guide to preparing the action plan. Refer to HSIE Stormwater Teaching Guide www.epa.nsw.gov.au/stormwater - click on the Action Planning Activity (Section 5).	**Outcomes** 5.1 identifies, gathers and evaluates geographical information 5.2 analyses, organises and synthesises geographical information 5.3 selects and uses appropriate written, oral and graphic forms to communicate geographical information **Fieldwork task:** - evaluates alternative solutions regarding the management of the issue - propose individual/group actions to address the issue

6. Implement Action Plan	**Outcomes** 5.9 applies geographical knowledge, understanding and skills to demonstrate active and informed citizenship **Fieldwork task:** - demonstrate active citizenship

Table 1: Interpreting Water Quality Data

Water Quality Data	Interpretation	Possible Source
Dissolved oxygen levels below 5mg/L	Oxygen levels below level required to maintain ecological health of waterway	Organic matter, leaves Sewage
Phosphate level above 0.05 mg/L	Nutrient levels above ANZECC guidelines for protection of ecological health of freshwater ecosystems – Danger of algal bloom	Fertiliser Detergents Sewage
Turbidity levels above 10 mg/L	Excess sediment is washing into waterway	Construction sites Erosion of soil from cleared land
Biochemical oxygen demand above 2mg/L	Excess organic matter in waterway	Excess leaves and other organic matter Sewage Excess growth of water plants and algae
Faecal coliform levels above 150 colonies/100 ml	Water is unsafe for swimming.	Sewage Animal droppings Dairy and feedlot contamination
Water smells of oil and grease; oily “rainbow” slick on the surface of the water	Water is being contaminated by oils and greases	Oil dripping from cars onto roads and driveways Oil and greases being tipped into stormwater drain Illegal dumping
Rubbish and litter	Rubbish on streets being washed into stormwater system	Uncovered rubbish bins Bad attitudes – people littering

Table 2: Action Planning Worksheet

Issue	
Strategy to address issue	
Actions to implement strategy (what)	
Responsibility for actions (who)	
When actions will be completed	