

January 26, 2011

TO: City and County Elected Officials

FROM: North Bannock County Groundwater Protection Citizen Advisory Committee

Comprehensive Plan Land Use Goals and policies that address water quality are common to the County and the cities of the metropolitan area:

*“Clean water is one of the most important aspects of livability in Bannock County. Accordingly the plan recommends establishing a new Water Resource Protection Overlay District as part of the county’s zoning regulations that limits potential sources of groundwater /aquifer pollution within the overlay district, manages the amount of water filtering into the aquifer, and retains areas that filter and absorb water back into the supply.” (Chapter 3, Bannock County Comprehensive Plan, 2008)*

*“Protect and enhance aquifers, aquifer-recharge areas, wetlands, streams, and rivers from activities that may be harmful to water quality.” (Chapter 6, City of Pocatello, Our Vision, Our Valley, Comprehensive Plan, 2003)*

*“Maintain water quality and protect aquifer recharge areas, wetlands, streams, rivers, and lakes.” (City of Chubbuck, Comprehensive Plan, 2002)*

At the June 14, 2010 City/County meeting, the Bannock County Intergovernmental Groundwater Technical Advisory Committee reported that indicators of water quality for the lower Portneuf Aquifer were of sufficient concern that recommendations were made for each local government (list of committee members and findings are appended). The Committee also recommended that a Citizen Advisory Committee finalize suitable recommendations for each entity. The CAC model recommended was based on Idaho Code and consisted of 12 members representing a cross-section of community interests (Appendix 1). The Citizen Advisory Committee began meeting September 22, 2010, and met through the fall, concluding in December with a set of recommendations included in Appendix 2 and summarized below.

The Committee consistently expressed the following themes: 1) water quality is good overall and we should do what is reasonably needed to keep it that way, 2) contamination of the high-quality groundwater will increase costs to everyone, and 3) regulations should be balanced with established building rights.

The Committee also requested information concerning local water quality protection measures from around the region. The recommendations made here are similar to those adopted in other areas of the state and region.

The Citizen Advisory Committee recommendations: are grouped as follows: 1) nitrates/septic systems, 2) hazardous materials and 3) storm-water runoff.

#### 1) NITRATES/SEPTIC SYSTEMS –

OVERVIEW: The impact of septic system effluent on groundwater quality is most evident in areas of high septic density. In these areas, nitrate levels in groundwater frequently approach or exceed the legal limit for drinking water of 10 mg/L. When functioning properly, septic systems only remove 25% of the nitrogen that enters them, and generally leach nitrates in concentrations of 40 mg/L. High septic density minimizes the ability of groundwater recharge to dilute nitrate, resulting locally in numerous private

wells (in certain areas) with nitrate levels above or approaching the legal limit, and numerous public wells (throughout the valley) at levels with nitrate levels in the 3-7 mg/L range. Minimum treatment/remediation cost estimates for nitrate removal from a municipal well by ion exchange or reverse osmosis system are \$500,000/year to treat a 1-2,000 gpm well. Residential and industrial properties within the area of city impact that remain on septic systems when sewer service is accessible and available are an unnecessary source of potential contamination of groundwater.

To address these concerns the City of Chubbuck will have the first phase of sanitary sewer installed and available for service in the Chubbuck Area of City Impact (ACI) in the spring of this year. The Chubbuck Impact Area Wastewater Collection Agency administers this project. The County has adopted (2009, 2010) sewer regulations that apply to land division and development in the Chubbuck ACI.

**HIGHLIGHTED RECOMMENDATIONS:** The CAC recommends that the County adopt new land division and development measures (see recommendations # 2, 3 and 3a of Appendix 2) for the Pocatello ACI, similar to the land division and development measures that the County adopted for the Chubbuck ACI.

The CAC also recommends that Pocatello update its sanitary sewer collection system master plan (facility plan) to include un-sewered areas, and work to sewer critical areas. The number one priority is to sewer the Johnny Creek area (see recommendation #7 of Appendix 2).

## 2) HAZARDOUS MATERIALS –

**OVERVIEW:** Land use activities provide many potential sources of ground water contamination, including underground storage tanks, dry well and floor drains, industrial and residential chemical storage and use, and accidental spills and leaks. Large industry and chemical users are strictly regulated; however, smaller users that store and use hazardous materials below regulatory threshold volumes can contribute to groundwater contamination through improper storage and use of hazardous materials. While the City of Chubbuck has a uniform business licensing program, no such program exists in the County or Pocatello to allow these entities to track the location of businesses that use and store hazardous materials. Such tracking programs are common nationwide and allow for greatly improved emergency response, as well as improved opportunities for education and outreach to help businesses implement best management practices for the storage and use of hazardous materials.

Additionally, hazardous chemicals can migrate through aquifer layers using improperly sealed well shafts. For example, in north Pocatello and Chubbuck it is thought that existing PCE plumes (and high nitrate levels) that are found in deep municipal wells have entered the deep aquifer layers through improperly sealed well shafts.

Finally, hazardous materials can enter the aquifer in areas where the aquifer material is exposed, such as gravel pits. Best management practices exist for remediation of closed pits to minimize the opportunity for such contamination.

**HIGHLIGHTED RECOMMENDATIONS:** The CAC recommends: 1) the development of local regulations to improve quality of well sealing to prevent migration of contaminants within the aquifer; and 2) new city and county ordinances for inspection and tracking of

businesses for presence and management of hazardous materials through the implementation of a uniform business licensing program.

### 3) STORMWATER –

**OVERVIEW:** Since 2006 Pocatello and Chubbuck and Bannock County have worked to implement the requirements of their federal National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer (MS4) permit. Progress was reported to the Citizen Advisory Committee concerning adopting ordinances and developing monitoring and enforcement procedures for storm water treatment from new and redevelopment activities. The City of Pocatello has adopted the Portneuf Valley Storm Water Quality Design Manual. This manual provides guidelines for the treatment of storm water prior to discharge into the ground or storm sewer system (which leads to the Portneuf River). Contaminants of concern that are frequently found in storm water include: sediment, heavy metals (from brakes), bacteria, nutrients and oil & grease.

**HIGHLIGHTED RECOMMENDATIONS:** The Citizen Advisory Committee recommended the adoption of a similar manual by Chubbuck and the County. This is a requirement of the NPDES MS4 permit with the EPA.

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**SUMMARY:** The Bannock County Intergovernmental Groundwater Protection Technical Committee will provide technical support toward implementation of the recommendations. The Pocatello/Chubbuck urbanized area Aquifer Protection Area Map is in the process of being refined and will accompany ordinance recommendations for each local entity.

Note In the Recommendations Chart (Appendix 2) some recommendations apply to the entire protection area and some to specific areas within the protection area.

Findings of the Groundwater Technical Advisory Committee,  
Submitted To The Citizen Advisory Committee

- Septic systems are a significant groundwater recharge source for the Lower Portneuf Valley Aquifer, particularly in the Black Cliffs, Mink Creek and Johnny Creek areas.
  - Each septic system discharges about 250-350 gallons/day.
- Each septic system discharges wastewater with levels of 40 mg/L into groundwater.
- Scientists agree that nitrate levels in groundwater of 3 mg/L (ppm) or above indicate man-made impacts.
- Pocatello has 17 active public water supply wells.
  - 11 of them have nitrate levels above 3 mg/L (ppm).
  - 2 additional wells have had at least one sample near or above 3 mg/L in recent history
  - 76% of the Pocatello water system is impacted by man-caused nitrate contamination
- Chubbuck public water supply wells are similarly affected.
- Principal recharge areas are the mountains and benches surrounding Pocatello and Chubbuck.
  - As this recharge flows through the subsurface, it carries contaminants to the main body of the aquifer.
- Pocatello and Chubbuck public water supply wells are located in the main body of the aquifer.
- Ground water movement in the central part of the aquifer body (the valley floor) is more rapid than it is through the mountains and benches.
- The dilution capacity of the rapidly moving part of the main aquifer body cannot keep up with the high volume contaminant input from unsewered and densely developed areas along the sides of the valley (Mink Creek, Johnny Creek, Gibson Jack, Black Cliffs).
- Nitrate levels increase toward the northern end of the aquifer indicating a cumulative effect on nitrate concentrations from the Portneuf Gap to Chubbuck.
- Other known contaminants and their plumes provide an additive or cumulative effect. (TCE, PCE, diesel/fuel, EDB, other chemicals).

The southern part of the aquifer is especially vulnerable due to a thin protective cover and shallow groundwater.

**Special Management Areas**

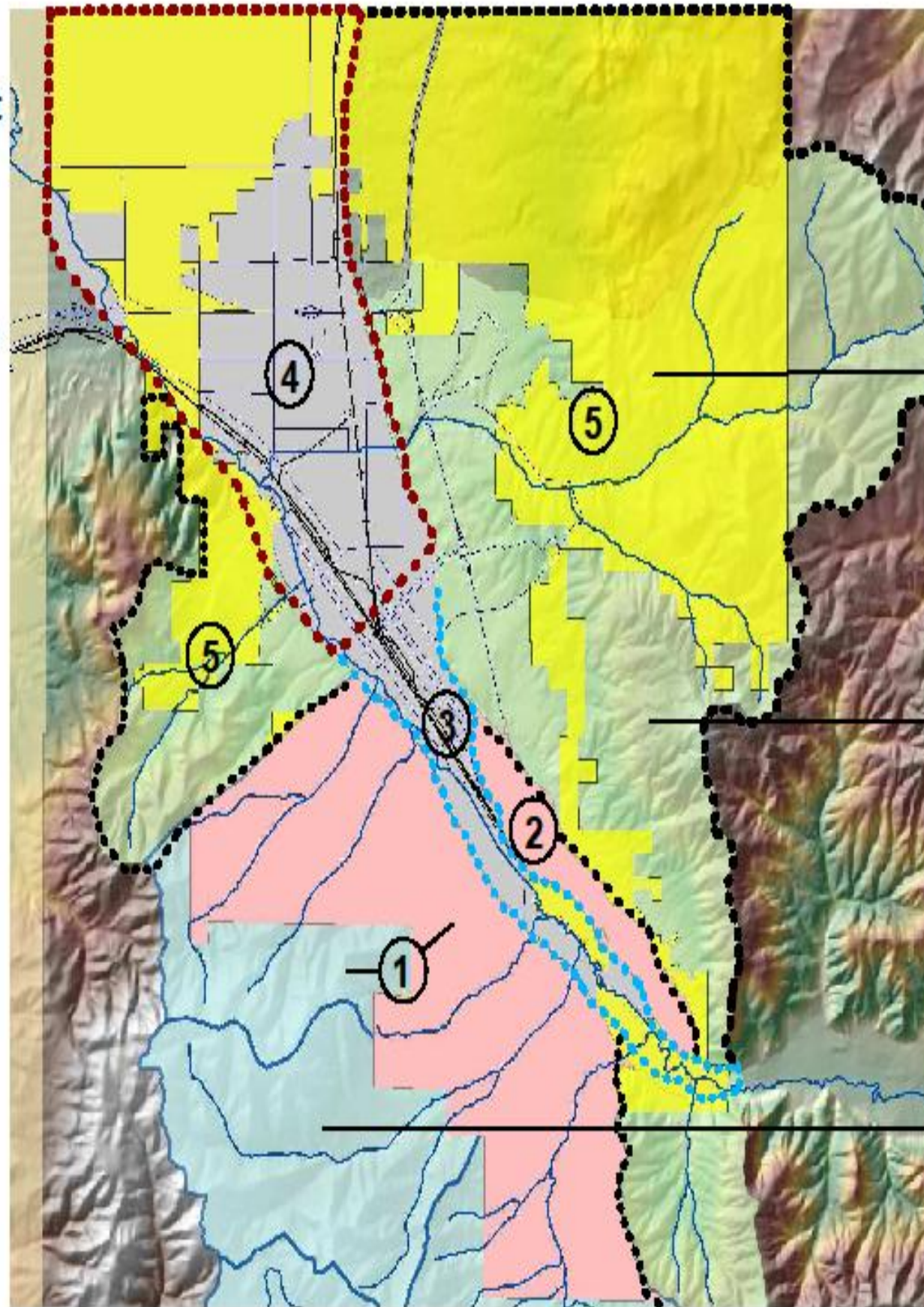
(1) Mink Ck. - City Ck.: Vulnerable area

(2) S. 5th St.: Area of drilling concern

(3) S. Valley: Shallow water table

(4) N. Valley: Area of drilling concern

(5) Pocatello Ck, Trail Ck, NE Hart areas



**Proposed Protection Area**

**Area of City Impact**

**LPRV Watershed Area**

**USFS Land**

**RECOMMENDATIONS BY AREA** (these are the same recommendations listed in Appendix 2 by type of contaminant)

**WHOLE PROTECTION AREA:**

- Recommendation 1. Cooperative education program with Health District.
- Recommendation 2. New septic tank permits require owners to connect to sewer when the existing sewer line is within 300' of the property
- Recommendation 9. New private and municipal wells shall be constructed with sealing standards that prevent the vertical migration of contamination to the aquifer.
- Recommendation 10. Educate landowners through education and outreach that a new drinking water well installation may be in a designated Nitrate Priority Areas (NPA).
- Recommendation 11. Mining (primarily gravel) and restoration regulated to protect aquifer.
- Recommendation 12. Cities and County adopt ordinances for inspecting all businesses for hazardous materials for presence and proper management of hazardous materials through implementation of a uniform business licensing mechanism.
- Recommendation 13. Critical Materials Education and Outreach to businesses and residents.
- Recommendation 14. Adopt Water Quality standards for stormwater infiltration.

**COUNTY -**

**Area 1: Mink Creek to City Creek:**

- Recommendation 3a amended. New development must connect to sewer or alternative approved treatment system that effectively reduces effluent nitrate by at least 50% as determined by the Health District for 3 or more new building lots.

**Area 2: South 5th Street / Eastern Aquifer AND AREA 3: South Valley Floor**

- Recommendation 3. New development must connect to sewer. (Excludes existing "grandfathered" lots).

**Area 4. North Valley Floor AND Area 5 – Other upland areas within the Watershed**

- Recommendation 3a. New development must connect to sewer for 3 or more new building lots.
- Recommendation 4. Maintain existing county minimum new lot size requirement for septic system in Area of City Impact.

**POCATELLO AND CHUBBUCK -**

- Recommendation 7. Update the facilities plan for sewerage five (5) sub-watersheds: *Johnny Creek, Gibson Jack, South Valley, Mink Creek, Pocatello Crk*
- Recommendation 4a. Cities should adopt new requirement that new lots with septic systems should be minimum of 5 acres.
- Recommendation 8. Sewer problem areas: *Johnny Creek, Bannock Highway, Black Cliffs, Tech Farm Road, Kraft Road, Dell Road.*
- Recommendation 4a. Cities should adopt new requirement that new lots with septic systems should be minimum of 5 acres.

APPENDIES:

- 1) **Committee Members**
- 2) **Recommendation Chart**
- 3) **Health Impacts of Ingested Nitrates – Bokelmann**
- 4) **Hazardous Waste Information**
- 5) **Comparison chart of water protection measures from other areas**

**Appendix 1**

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**Citizen Advisory Committee** (representation similar to Title 39, Chapter 5, Aquifer Protection Districts)

Justin Armstrong, City of Pocatello Water Dept  
Arnold Appeney, Land Use Director , Tribal Planning Office  
Tim Anderson, Greater Pocatello, Chamber of Commerce  
Dr. Jean M. Bokelmann, MD, ISU Student Health Center  
Kevin Koester, Vice Chairman, Portneuf Soil & Water Conservation District  
Amy Mercy, Great Western Malting, Plant Manager  
Kevin Pace, Caribou Acres water system operator /small private system  
Michelle Pak, Three Rivers RC&D, Project Coordinator  
Rick Parker, Citizen Consumer (City of Pocatello)  
Gary Seymour, Realtor (alternate)  
Tim Shurtliff, Bannock County Engineer  
Steve Smart, City of Chubbuck, Engineer  
Kevin Spencer, Private water system and Fire District (alternate)  
Dr. Glenn Thackray, Idaho State University, Geosciences , Idaho State University  
Randi Thomson, Southeast Idaho Builders and Contractors Association (alternate)

**Groundwater Protection Technical Advisory Committee**

Paul Andrus, Planner, City of Chubbuck  
Shannon Ansley, Environmental Hydrogeologist, Department of Environmental Quality  
Justin Armstrong, Superintendent Water Department, City of Pocatello,  
Dennis Dunn, Idaho Department of Water Resources  
Steve Ernst, Planner, Bannock County  
Jeffery Hammes, District Ranger, U.S. Forest Service  
Tom Hepworth, Idaho Department of Environmental Quality  
John Herrick, City of Pocatello, Superintendent, Water Pollution Control  
Emma George, Committee Member, Planning Department, Shoshone-Bannock Tribes  
Tom Mullican, Idaho Department of Environmental Quality  
John Norstog, Planning Director, Shoshone Bannock Tribes  
BJ O'Doherty, District Conservationist, U.S. Department of Agriculture  
Steve Pew, Environmental Division Manager, Southeast Department of Health  
Hannah Sanger, Environmental Educator, City of Pocatello  
Tim Shurtliff, Engineer, Bannock County  
John Sigler, Senior Environmental Coordinator, City of Pocatello  
Kevin Spencer, Private Water System  
George Spinner, Managing Scientist, Cascade Earth Sciences  
Glenn Thackray, Hydrogeologist, Idaho State University  
Linda Tigert, Office Coordinator, Planning and Development Services, Bannock County  
John Welhan, Affiliate Faculty & Research Hydrologist with The Idaho Geological Survey

**Appendix 2**

	<b>RECOMMENDATIONS</b>	<b>AREA</b>	<b>CAC COMMENTS</b>	<b>COMP PLAN</b>	<b>IMPLEMENTATION</b>
<b>NITRATE / SEPTIC SYSTEMS</b>	1. Cooperative education program with Health District.	Whole overlay area	Expand education outreach to include website, PSA's, TV coverage (news), Mayors' newsletters, direct mailing. Education tool to be reviewed by CAC.	BC: LU6.1 POCA: Chpt? G1 CHUB: Chpt 7.g.	Web site being developed and should be available summer '11; no additional costs; to be maintained by County, Pocatello and Chubbuck.
	2. New septic tank permits require owners to connect to sewer when the existing sewer line is within 300' of the property	Whole overlay area	Explore ways to defer cost of connection. Pursue 319 Grant or Sensitive Aquifer designation.	BC: LU5.4 PO: Chpt 3,G2, O2.1 CH: Chpt 7, O6.4	Current county ord. for Chubbuck ACI; Amend County Zoning Ord. include map.
	3. New development must connect to sewer. (Excludes existing "grandfathered" lots).	Sub areas 2, 3	Most lots within reach of existing sewer lines.	BC: LU5.4 PO: Chpt 3,G2, O21 CH:	County amend Zoning Ord. with overly map and highlight sub areas.
	3a. New development must connect to sewer for 3 or more new building lots.	Sub areas 4, 5	Primarily within city limits. City of Pocatello must update their facilities plan to sewer this area.	BC: LU5.4 PO: CH:	County amend Subdivision and maybe zoning Ord. with overlay map and highlight sub areas
	3a amended. New development must connect to sewer or alternative approved	Sub area 1	A "sewer" could include options such	BC: LU5.4	Amend County Zoning Ord and Subdivision Ord. with

	RECOMMENDATIONS	AREA	CAC COMMENTS	COMP PLAN	IMPLEMENTATION
	treatment system that effectively reduces effluent nitrate by at least 50% as determined by the Health District for 3 or more new building lots.*		as connecting to a force main. Private small community treatment systems have been problematic. Recommend a mechanism to follow up on treatment system maintenance. Work with Health District on enforcement.	PO: CH:	overlay map and highlight sub area 1 only
	4. Maintain existing county minimum new lot size requirement for septic in ACI	County		BC: LU6.3 PO: CH:	No change -
	4a. Cities should adopt new requirement that new lots with septic systems should be minimum of 5 acres.	Chubbuck and Pocatello		BC: PO: CH:	Chubbuck and Pocatello amend (zoning and/or Subdivision ordinance)
	5. New development must conduct septic suitability studies to determine if septic will be allowed.	n/a	No Action - not applicable in light of other recommendations and lack of authority to approve -(no standards in place to evaluate)	BC: PO: CH:	No action



	RECOMMENDATIONS	AREA	CAC COMMENTS	COMP PLAN	IMPLEMENTATION
	6. Do nothing until municipal wells exceed legal nitrate limits (if that happens)	n/a	No action	BC: PO: CH:	No action
	7. Update the facilities plan for sewerage five (5) sub-watersheds: <i>Johnny Creek, Gibson Jack, South Valley, Mink Creek, Pocatello Crk</i>	Pocatello	City of Pocatello update facilities plan to sewer this area	BC: PO: Chpt? G1 Ob1.2, G2 Ob 2.4, CH:	
	8. Sewer problem areas: <i>Johnny Creek, Bannock Highway, Black Cliffs, Tech Farm Road, Kraft Road, Dell Road</i>	Pocatello and Chubbuck		BC: PO: CH:	
HAZARDOUS MATERIALS	9. New private and municipal wells shall be constructed with sealing standards that prevent the vertical migration of contamination to the aquifer.	Whole overlay area		BC: PO: CH:	
	10. Educate landowners through education and outreach that a new drinking water well installation may be in a designated Nitrate Priority Areas (NPA).	Whole overlay area		BC: PO: CH:	
	11. Mining (primarily gravel) and restoration regulated to protect aquifer.	Whole overlay area		BC: PO: CH:	
	12. Cities and County adopt ordinances for inspecting all businesses for hazardous	Whole overlay		BC:	

	RECOMMENDATIONS	AREA	CAC COMMENTS	COMP PLAN	IMPLEMENTATION
	materials for presence and proper management of hazardous materials through implementation of a uniform business licensing mechanism.	area		PO: CH:	
	13. Critical Materials Education and Outreach to businesses and residents.	Whole overlay area		BC: PO: CH:	
STORM WATER	14. Adopt Water Quality standards for storm water infiltration.	Whole overlay area	Each jurisdiction has adopted or in the process of adopting	BC: PO: CH:	