2002 February 8
File: 5280-30 – Watershed Mgt Planning

TO: N. Cook, City Manager

FROM: D.E. Day, General Manager Planning and Development

SUBJECT: **WATERSHED MANAGEMENT PLANNING IN COQUITLAM**

GROWTH MANAGEMENT COMMITTEE

RECOMMENDATION

"1. That Council direct staff to prepare a proposed citywide watershed management planning strategy for identifying watershed boundaries, prioritizing watersheds for study, and integrating watershed management into municipal processes as outlined in the body of this report, while ensuring that this strategy is consistent with current City policies on watershed management;

2. That staff report back to Council with this proposed citywide watershed management planning strategy and accompanying action plan."

EXECUTIVE SUMMARY

Council has directed staff to address watershed management planning approaches appropriate for Coquitlam. There is widespread recognition that watersheds are fundamental land use and development planning units for examining the interactions of physical, biological and human systems. The City of Coquitlam has already committed to a watershed management approach through a number of policies (including the Northeast Coquitlam Official Community Plan, proposed Citywide Official Community Plan, the Liquid Waste Management Plan, and others), as well as through recent projects (such as the Northeast Coquitlam Terrain and Watershed Study, the Como Creek Watershed Management Plan, the Hyde Creek Watershed Management Plan, and others).

While the City and other local governments in the GVRD have embraced watershed-based management planning, there is still a need for the City to identify watershed boundaries and to develop citywide strategies for prioritizing and studying local watersheds. In addition, effective strategies for covering the costs of such plans need to be explored.

EXECUTIVE SUMMARY cont'd/

Five elements of a successful watershed management plan are presented in this report and the relationship between integrated stormwater management and watershed management planning is explored. Elements for successful watershed management planning include:

1. Management plans must be developed at the appropriate watershed scale;
2. Management plans at various watershed scales must be consistent;
3. Management plans (all scales) must be flexible and tailored to suit local watershed conditions;
4. Watershed management plans (all scales) must include implementation and monitoring; and
5. All interests must be represented.

In applying these elements to the Coquitlam River Watershed, it was observed that there are a number of key points that need to be considered before deciding whether to proceed with an overall Coquitlam River watershed management plan. These points include jurisdiction over the watershed, watershed management goals in the City's existing policies and bylaws, and current initiatives underway in the watershed.

The final section of the report outlines critical needs that must be addressed in order to facilitate the implementation of watershed management planning in a manner that is consistent with our current Official Community Plans, the 2000 Strategic Plan and other City policies.

BACKGROUND

As a follow up to Council direction and interest expressed by the Environment Committee, Council has directed staff to address watershed management planning approaches for Coquitlam. This report has been developed in response to this direction.

There is widespread recognition that watersheds are fundamental land use and development planning units for examining the interactions of physical, biological and human systems. A watershed-based approach enables the integration of a range of goals including:

- Protection of people and property from natural hazards such as flooding and erosion;
- Preservation and maintenance of healthy aquatic and terrestrial ecosystems;
- Management of water quality and hydrology;
- Continuation and growth of economic activities;
- Provisions for population and development needs based on regional and community objectives;
- Preservation of resource production capability such as soil-based farming;
- Provision of affordable housing, infrastructure and servicing;
- Provision of recreational amenities and opportunities; and
- Identification of potential opportunities for habitat enhancement and restoration, where feasible.

BACKGROUND cont'd/

Pursuing a watershed-based approach can help avoid or mitigate flooding, slope failure, degradation or destruction of the natural environment, reductions in resource production capability and higher costs for infrastructure construction and maintenance.

The City has already committed to a watershed management approach through the following policies.

1. **The** ***Northeast Coquitlam Official Community Plan (OCP)*** commits the City to undertaking a phased strategy to prepare watershed-based integrated stormwater management plans for Hyde Creek, Smiling Creek and the Fox, Star and Partington Creek systems. These stormwater management plans are to be undertaken as a component of more detailed neighbourhood plans.

2. T**he** ***Greater Vancouver Regional District (GVRD) Liquid Waste Management Plan*** commits member municipalities to undertake (or review) integrated watershed management planning for urban watersheds at an annual rate such that each watershed is reviewed every twelve years.

3. ***Council Resolution 702*** states that the following initiatives be undertaken before development proceeds in the Northeast Coquitlam:
   - a watershed management plan;
   - a new east–west traffic route capable of handling the projected population growth; and
   - the installation of infrastructure without incurring additional debt and further burden to the taxpayer.

4. **The** ***Northeast Coquitlam OCP Implementation -- Integrated (Sub)-Watershed Management Plan Framework***, as attached to the Riverwalk Development Agreement, requires that a (sub)-watershed management plan be prepared in conjunction with the neighbourhood plan framework in a manner that is consistent with the objectives of the Northeast Coquitlam OCP.

5. ***The City's 2000 Strategic Plan*** supports the integration of watershed management with land use planning, policy and infrastructure maintenance and construction.

6. ***The Proposed Citywide OCP*** promotes the comprehensive management of Coquitlam's watercourses over the longer term through watershed planning principles, appropriate land use planning and integrated stormwater management strategies, as feasible.

Recent watershed-based studies that have been completed by the City include the Northeast Coquitlam Terrain and Watershed Study (Dayton Knight Ltd., 1998), and the Como Creek Watershed Management Plan (CH2M Gore and Storrie Ltd., 2001). The City also participated in the Stoney Creek Integrated Watershed Management process (1998). At present, the Coquitlam River Watershed Society, in partnership with the City, is working on a Coquitlam River Watershed Atlas. The City is currently developing a request for proposals for a Hyde Creek Watershed Management Plan. Among future work program items is a Town Centre update that can include a Scott/Hoy Creek Watershed Management Plan.

BACKGROUND cont'd/

While the City and other local governments in the GVRD have embraced watershed-based management planning, there is still a need for the City to identify watershed boundaries and to develop citywide strategies for prioritizing and studying local watersheds. In addition, effective strategies for covering the costs of such plans need to be explored.

ELEMENTS OF A SUCCESSFUL WATERSHED MANAGEMENT PLAN

Thomas Schueler, in *Crafting Better Urban Watershed Protection Plans* (1996), suggests that there are a number of elements to developing a successful watershed management plan. The elements described below are adapted from this reference.

1. **Management Plans Must Be Developed At The Appropriate Watershed Scale**
   Current literature suggests that the sub-watershed level is the most appropriate level to be doing detailed, and effective local management plans that set development criteria and best management strategies that are to be implemented at the site level. Schueler sites the following arguments in support of sub-watershed management plans:

   - The influences of impervious cover on hydrology, water quality and biodiversity are most strongly felt at the sub-watershed level.
   - Sub-watersheds are usually contained entirely within the same political jurisdiction which helps establish clear and direct regulatory authority and responsibility for implementation.
   - It is easier to isolate important differences in stream quality and development patterns within a single sub-watershed as opposed to a watershed that may contain several sub-watersheds.
   - The number of stakeholders engaged in the process increases with watershed size.
   - The costs of watershed management planning increase with watershed size.

2. **Management Plans At Various Watershed Scales Must Be Consistent**
   While the sub-watershed is the most appropriate geographic unit for carrying out detailed watershed management plans, the broad goals and objectives of sub-watershed management plans must be consistent with those of the larger watershed. Note that, at the local government level, it is possible to distinguish between three different types of watershed management plans as follows:

   Watershed Management Plans (encompassing areas up to 300 km^2)
   These are higher level, strategic plans that may provide:
   - A map of the watershed and delineates watershed and sub-watershed boundaries;
   - A set of goals and objectives and a vision for the watershed as a whole;
   - An assessment of overall watershed conditions and health; and
   - An assessment of population and development needs based on regional and community objectives.

2. Management Plans At Various Watershed Scales Must Be Consistent cont'd/

Sub-watershed Management Plans (with areas ranging from approximately 5 to 40 km^2)
These are detailed watershed plans that:

- Are prepared at the neighbourhood planning level;
- Integrate land use planning, engineering and environmental studies and analyses;
- Identify physical and environmental opportunities and constraints;
- Sets implementation strategies, development criteria, best management practices and performance targets to be achieved at the site level.

Site or Catchment Area Plans (with areas that may be less than 3 km^2)
These are the operational plans that:

- Are generally carried out by the landowner;
- Detail specific development strategies and best management practices that are to be carried out on the site in order to achieve sub-watershed goals and objectives.

3. Management Plans (All Scales) Must Be Flexible and Tailored To Suit Local Watershed Conditions

Each municipality has different policies and visions for the future, which depend on existing and planned levels of development, physical and climatic characteristics, existing and potential aquatic resources, and social and political context. Therefore, watershed management plans must be tailored to suit unique municipal needs and local watershed conditions.

4. Watershed Management Plans (All Scales) Must Include Implementation And Monitoring

A watershed management plan offers more than a watershed study or technical analysis. It involves the integration of planning, engineering and environmental disciplines to develop sound policies, best management practices, and implementation measures that meet local, regional and other regulatory requirements. It must also include a mechanism for performance monitoring of initiatives within the watershed so that informed and appropriate adjustments can be to be made to the plan, as needed.

5. All Interests Must Be Represented

There are several models for representation in watershed management planning. One such model calls for an inter-departmental steering committee providing direction to a technical consultant team that develops the plan. Opportunities for public input are provided at various critical stages in plan development. Whichever model is chosen, it is important to ensure that the appropriate interests are represented to the plan to ensure credibility and support for the process.

RELATIONSHIP BETWEEN INTEGRATED STORMWATER MANAGEMENT AND WATERSHED MANAGEMENT PLANNING

The GVRD hired Kerr Wood Leidal (KWL) and Entranco Inc. to develop a template for integrated stormwater management planning (ISMP) in an effort to provide local governments with a unified approach to stormwater management planning under the Liquid Waste Management Plan. The ISMP tool is designed to facilitate development while protecting the environment. It integrates land use planning with stormwater engineering, flood and erosion protection, environmental protection and community values. The ISMP includes a process for screening and prioritizing watersheds, scoping and undertaking the ISMP study, through to more detailed servicing functional/feasibility plans (capital improvements) that lead to the design of proposed works.

While this ISMP initiative is being explored by various municipal engineers in the GVRD Stormwater Management Task Group, a sub-committee of the GVRD Technical Advisory Committee (TAC), headed by Erik Karlsen (Ministry of Community, Women's and Aboriginal Services) is currently working on a Draft Discussion Paper on a Framework for a Watershed-Based Approach to Community Planning in the GVRD. This discussion paper presents an approach to watershed planning that is intended to operate within the context of existing regional and municipal strategies such as the regional growth strategy and official community plans.

It is interesting to note that "integrated stormwater management planning" is sometimes used interchangeably with "watershed management planning". Both involve the integration of science, engineering, land use planning and community values, but with slightly different focuses (e.g. the primary focus of ISMPs is stormwater management.)

KWL suggests that ISMPs are ideally conducted at a scale of 5 to 7.5 km^2 (500 to 750 ha) that roughly corresponds to the scale of the sub-watershed management plan. Thus, there are definite opportunities to combine both studies to ensure no duplication of efforts as well as to make best use of limited resources. However, care must be taken in developing the terms of reference for these studies in order to ensure that stormwater management, land use planning, and stream corridor protection are adequately addressed.

APPLICABILITY TO THE COQUITLAM RIVER WATERSHED

The Coquitlam River watershed, approximately 260 km^2 (260 000 ha) in area, is by far the largest watershed in the City. It is composed of at least five sub-watersheds ranging in size from 2 to approximately 20 km^2. The table below suggests sub-watershed groupings based on similar watercourse characteristics, proximity, and stream order. Note that the watershed and sub-watershed areas are approximate and need to be verified. Only those sub-watersheds within the Coquitlam City boundary are shown, while the area for the Coquitlam River provided is for the entire watershed area. Also, there are other sub-watersheds, occupied by unnamed tributaries, within the Coquitlam Watershed that are not shown in this table.

APPLICABILITY TO THE COQUITLAM RIVER WATERSHED

WATERSHED	APPROX. SIZE (km^2)	SUB-WATERSHEDS (partial list only)	PRIMARY LAND USE	APPROX. SIZE (km^2)
Coquitlam River	262 km^2 (entire watershed)	Colony Farms	*Agriculture*	2 km^2
		Scott, Hoy, Falcon, Maple, Grist	*Residential, Town Centre*	16 km^2
		Kelly, Pritchett, Coho, Orr	*Pinecone-Burke Provincial Park*	18 km^2
		Falacea, Mantle, Partridge, Marquart	*Gravel Mining*	5 km^2
		Goodyear, Hockaday	*Gravel Mining, Some Residential*	2 km^2

The benefits of having an overall watershed management plan to guide the goals and objectives of sub-watershed management plans, have been mentioned earlier in this report. However, there are a number of points that needed to be considered before deciding whether to proceed with this work.

First, as is apparent from the above table, other than the Scott/Hoy Creek sub-watershed, there are several watersheds within the Coquitlam River that are governed by jurisdictions other than the City. Gravel mining, provincial parks and agriculture are governed by provincial agencies, while Colony Farms is owned by the GVRD. The Kwitkwitlem First Nations also have reserve lands near the mouth of the Coquitlam River. From this point of view it may make sense to allocate limited City resources to sub-watershed management planning, especially in those areas over which the City has jurisdiction.

Second, based on current conditions in the Coquitlam River watershed, the goals and objectives that are likely to be derived from a high-level strategic watershed management plan process for this large watershed could potentially include measures to: improve water quality, reduce sedimentation, control stormwater runoff, protect riparian corridors and environmentally sensitive areas, and ensure adequate protection against flooding. Many of these goals and objectives are already articulated in the City's existing policies and bylaws such as the proposed Citywide OCP, or will be articulated under the revised Subdivision Control Bylaw and the future Stormwater Policy Manual. Both the revised Subdivision Control Bylaw and the future Stormwater Policy Manual will move the City forward in the direction of managing watersheds more effectively. Sediment control is the primary issue that is being addressed by the Coquitlam River Aggregate Task Force.

As mentioned earlier, the Coquitlam River Watershed Society, in partnership with the City and Port Coquitlam, is working on a Coquitlam River Watershed Atlas. This Atlas, to be completed by the end of March 2002, will provide a comprehensive geographic information systems (GIS) display of land uses, streams, environmentally sensitive areas, total impervious areas, demographics and other technical data.

APPLICABILITY TO THE COQUITLAM RIVER WATERSHED cont'd/

Finally, preparing a strategic watershed management plan for the Coquitlam Watershed is no small undertaking, and a decision to go this route must be done within the context of a citywide strategy for prioritizing and studying Coquitlam watersheds. Currently the City does not have such a framework. The following section outlines critical needs that must be addressed in order to facilitate the implementation of watershed planning related items as outlined in our current City Official Community Plans, 2000 Strategic Plan and other policies.

WATERSHED MANAGEMENT PLANNING NEEDS IN COQUITLAM

For effective implementation of watershed management planning measures in the City, the following needs must first be addressed:

1. **Need to identify watershed and sub-watershed boundaries**
   With the exception of the Coquitlam River and the Como Creek, the City has not yet identified watershed boundaries for its watersheds, much less sub-watershed boundaries. Delineating watershed boundaries is a complex process that involves examining topography as well as stormwater catchments and flows. The City needs to establish watersheds and sub-watershed boundaries as a first step so that watersheds can be grouped into appropriate management units for analysis and planning.

2. **Need a strategy or set of criteria for priorizing watersheds for study in Coquitlam**
   Drivers behind urban watershed management planning may include development pressure, resources protection/stewardship, regulatory approvals, and flooding/restoration remediation. While there is a recognized need to do watershed management plans for Scott/Hoy Creek, Hyde Creek and other Northeast Coquitlam watersheds, the City currently does not have an overall strategy for selecting and prioritizing watersheds for study. This will require further input from several City departments. Watershed classification and prioritization are consistent with the provincial Living Rivers Act Implementation Strategy.

3. **Need a strategy for determining the timing of watershed management plans and how they can be incorporated into municipal processes (land use, financial, capital and operational processes)**
   The draft provincial discussion paper on Watershed-Based Approach to Community Planning attempts to integrate watershed planning within the context of municipal land development approval stages from the OCP to the neighbourhood plan and down to the site level. For example, it explains that sub-watershed management planning is done at the neighbourhood plan level and the implementation and operational plans occur at the site level. The City needs to develop its own strategy for timing and integration with City processes.

WATERSHED MANAGEMENT PLANNING NEEDS IN COQUITLAM cont'd/

4. **Need a strategy to integrate stormwater management planning and land use into watershed management plans**
   As mentioned earlier, there are strong links associated with integrated stormwater management planning and watershed management planning, and there are cost and resource efficiencies realized in linking both studies at the sub-watershed level. The City needs to explore links between these two processes to ensure that land use planning, engineering and environmental needs are met, potentially in a combined study.

5. **Need to determine an appropriate scale and level of detail for watershed management plans**
   Sub-watershed management plans are typically done at a scale of 5 to 40 km^2 (500 to 40 000 ha). For perspective, the Como Creek watershed is approximately 11 km^2, while the DeBoville Slough watershed at 38 km^2 (includes all tributaries), is at the upper end of this scale. The City needs to adopt its own scale for doing sub-watershed management plans, based on local context, geography and City needs. Some of this work will be addressed in the proposed Stormwater Policy Manual.

6. **Need to develop innovative strategies for paying for watershed management**
   Watershed management plans and stormwater management plans can be costly studies ranging from $50,000 to $150,000 depending on the size of the watershed and the level of technical details required. A GVRD survey completed by KWL identified the following options for covering the costs of integrated stormwater management plans:
   - drainage capital from the tax base;
   - stormwater utility;
   - cost-sharing financial partnerships with other agencies and organizations with a vested interest; and
   - development cost charges.

In the City of Surrey, developers are responsible for doing stormwater management studies covering less that 20 ha (0.2 km^2). The City of Coquitlam needs to develop its own strategy for covering the costs of watershed management plans and integrated stormwater management plans.

CONCLUSION

Watersheds are fundamental land use and development planning units for examining the interactions of physical, biological and human systems. While the City and other local governments in the GVRD have embraced watershed-based management planning, there is still a need for the City to identify watershed boundaries and to develop citywide strategies for prioritizing and studying local watersheds. In addition, efficient strategies for covering the costs of such plans need to be explored.

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