Compliance with the Riparian Areas Regulation (RAR)

Report on Monitoring Activities for
Assessments Submitted in 2007

May 2009

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1.0 Introduction

The Riparian Areas Regulation (RAR) was brought into force March 31, 2006. The RAR is an alternative regulatory model that directs local governments to approve or allow development within a 30 meter riparian assessment area only if a Qualified Environmental Professional (QEP) has certified that the development will not result in a harmful alteration of riparian fish habitat or an authorization is granted by Fisheries and Oceans(DFO). The model uses QEPs hired by proponents to help design development that avoids impacts, assesses impacts, develops mitigation measures or recommends compensatory strategies.

A development proponent is considered to have exercised reasonable due diligence if they have received a scientific assessment for the development that has been designed to avoid impact and is conducted to standard by a QEP. This shifts the cost of assessing development to the proponent and allows governments to focus on monitoring and enforcement within their respective jurisdictions. To ensure that standards and conditions are met and that development occurs in a way that protects riparian areas, ongoing project monitoring and auditing are essential to ensure that the RAR meets its commitment to adaptive management[1].

The overall monitoring strategy is aimed at assessing compliance with the regulation by QEPs, developers, and local governments, as well as assessing the effectiveness of the regulation at protecting the riparian features functions and conditions that support fish life processes. As part of the overall monitoring strategy, compliance monitoring assesses the degree to which assessments are consistent with the assessment methods (QEP compliance) and whether the development is consistent with the results of the assessment (developer compliance).

Compliance monitoring can be separated into routine compliance monitoring and complaint-based monitoring. Routine monitoring focuses on project integrity and compliance with approved design and is undertaken through a random sample (see Section 2.4 or Appendix 1). A subset of the Assessment Reports prepared by QEPs may be reviewed for accuracy, completeness, and quality prior to, during and after construction. This document reports the findings for QEP and developer compliance with RAR standards for assessments completed in 2007.

1.1 Purpose of Compliance Monitoring

Measuring compliance in a structured, standardized approach is important for several reasons. First, compliance monitoring reveals improvements that are needed in the RAR program that can be addressed through adaptive management. Second, experience with compliance monitoring should enable an understanding of the project types that have a

[1] Defined for the purpose of the RAR as a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs.

greater potential for causing HADDs[2]. This can be used in training and developing preventative action. Third, compliance monitoring is fundamental to reporting on compliance with the RAR to the public.

1.2 Scope of Compliance Monitoring

The scope of compliance monitoring outlined in this report is limited to key elements of RAR implementation. These are:

- Compliance of QEPs with the methodology for carrying out RAR assessments (field check); and,
- Compliance of development proponents in following the conditions in the assessment.

2.0 Methodology

2.1 Approach

The following steps are required for RAR compliance monitoring:

1. Sites are randomly selected (see below)
2. Report status is checked ("accepted" or "rejected")
3. Final report is audited, accompanying report checklists are read
4. Site Assessment is conducted using standard checklist
5. Site checklist is uploaded to SharePoint site
6. Issues are actioned

2.2 Monitoring Framework

The framework was developed in an iterative process using technical background materials on the RAR, as well as the results of a workshop with Ministry of Environment (MOE) and Fisheries and Oceans (DFO) staff in October 2007. The technical materials were assembled and used to develop a discussion paper as an input to the workshop. The workshop outputs consisted of confirming strategic directions, elaborating guiding principles and visioning a framework structure and its component parts. Statisticians from Simon Fraser University developed further input on sampling program design. These inputs have been synthesized into a framework document (Wilkes 2008).

[2] HADD = Harmful Alteration, Disruption or Destruction of Fish Habitat (Fisheries Act, Section 35)

2.3 Compliance Target

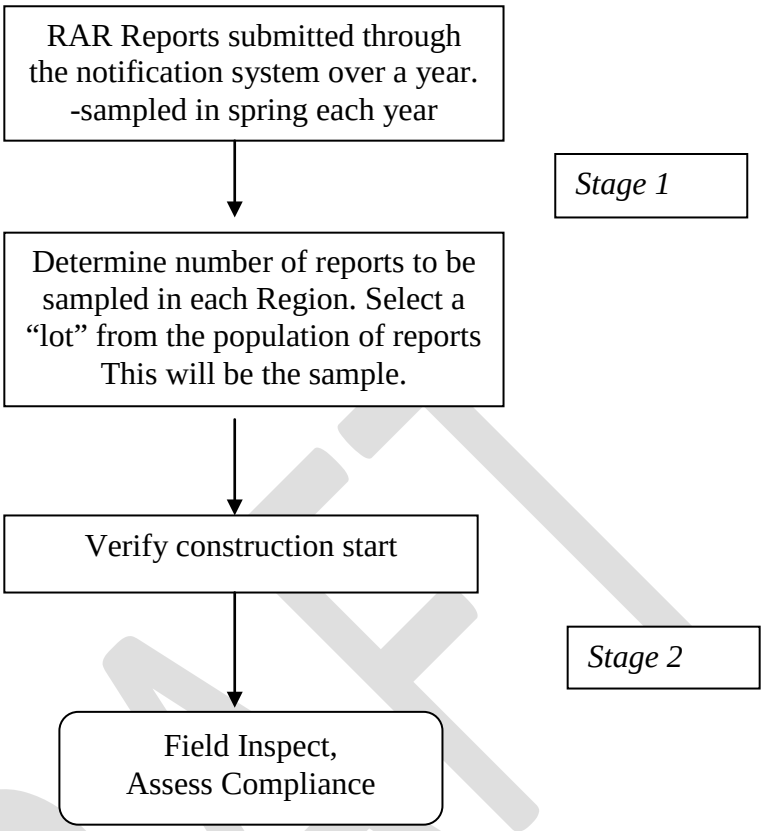
For the purposes of designing the monitoring framework, a compliance target or benchmark was agreed upon by MOE and DFO. The target is to achieve 90% compliance with 90% confidence. Another way of saying this is that there will be 90% confidence that non-compliance is less than 10%.

2.4 The Random Sample

The sampling methodology calls for two stages to the monitoring program (Figure 1). The first stage involves the selection of the assessment reports to be evaluated for compliance. The intent is to sample the accumulated reports once per year, in a manner that will result in confidence that the compliance target identified in Section 2.3 has been met. To do this, a certain number of the reports are randomly selected from amongst all the received reports for that year. The randomly selected reports are regarded as a group, or "lot". If the number of "rejects" in the lot is below a certain minimum, the lot can be accepted as meeting the 90% compliance within the stated confidence limits. If the number of "rejects" exceeded the minimum, then the lot is not accepted, and the compliance rate is below 90%. This system is analogous to a production line of widgets or bullets. If a certain proportion in a lot is defective, the whole lot is rejected. For RAR reports, if this is the finding, then the rejected reports can be assessed to determine the problem, and this can be reported and used to adjust QEP training. For example, if 300 reports are received in a year, then a sample of 85 reports would be selected for examination (Appendix 1, Table 2). This would be regarded as the random sample.

Only the reports in the random sample for which it can be verified that construction has started will be reviewed. By visiting only sites were construction has begun both QEP and Developer compliance can be assessed with one visit. Ministry staff must verify if construction has started at the sites described in the reports selected. If construction has not started then another report would be randomly selected, and a construction start verified for it. In this way, reports would continue to be selected and construction start verified until the sample size of 85 verified reports is achieved. If 5 or less of these are reviewed and found to be not in compliance, then a compliance of 90% has been achieved with 90% certainty. The chance of falsely accepting a bad lot is less than 25%, which is deemed statistically acceptable.

Figure 1. RAR Compliance Monitoring Framework



2.3 Confirming Compliance On-site

In the B.C. Mainland (Lower Mainland, Okanagan, Thompson and Kootenay regions), sites were assessed for both QEP and developer compliance. On Vancouver Island, as part of an initiative by the Conservation Officer Service (COS), only developer compliance was monitored. The two areas (B.C. Mainland and Vancouver Island) are therefore treated as two separate components in this report.

2.3.1 B.C. Mainland

Site monitors used a standard checklist (Appendix 2) that allows confirmation of the key elements of the RAR methodology. Specifically, the site monitors confirmed that:

a. All watercourses were assessed and identified correctly (Stream, lake, wetland, ditch)
b. Reach breaks and site potential vegetation were identified correctly
c. Channel widths and gradients for stream were properly assessed

d. The correct aspect of the watercourse was applied (north-south, east-west)
e. The high water mark, including the active floodplain, was properly identified in the field
f. The correct Streamside Protection and Enhancement Area (SPEA) was determined in the report and flagged properly on the ground
g. The "measures" recommended to protect the SPEA were appropriate to the site and proposed development and were followed by the developer

2.3.2 Vancouver Island

During the inspection, the site was checked using site inspection forms for proper marking of the SPEA on the ground, and any encroachment into the SPEA by development activities was noted. The site was photographed. The measures set forth in the report were evaluated for appropriateness based on the nature of the site and the development. On sites where development was in the construction stage, the proper implementation and effectiveness of measures in protecting the SPEA was recorded.

Two broad categories, labeled 'encroachment' and 'other non-compliance' were used, based on whether encroachment into the SPEA was observed during the field check or if the site was non-compliant with RAR based on other reasons. Encroachment was considered to be more serious than if the RAR assessment was not followed properly but the SPEA had not been compromised by the development.

3.0 Results

In total 108 sites were monitored to determine compliance with the Riparian Areas Regulation (RAR). Forty-five sites within the Okanagan, Thompson, Lower Mainland and Kootenay Regions were reviewed on the ground to determine if the SPEA had been calculated and marked correctly by the QEPs, and if developers were following the requirements of the assessment reports. Sixty-three sites were monitored on Vancouver Island by the COS to check compliance by the developer with QEP recommendations in the RAR reports. These results (Vancouver Island) will be treated as a separate data set within this report (Section 3.2).

3.1 B.C. Mainland

Out of 45 sites, there were 27(60%) that were considered to be compliant with the RAR (Table 1& Table 2). There were 18 (40%) sites that were determined to be non-compliant with RAR, but of these sites there were 9 where encroachment into the SPEA was observed (Figure 2). Nine sites were non-compliant for other reasons, but no encroachment was observed at the time of the site visit.

Table 1. Summary of assessments conducted per region and overall

MOE Region	Compliant	Non-compliant	Total
Kootenay	0	1	1
Lower Mainland	10	8	18
Okanagan	16	6	22
Thompson	1	3	4
Overall	**27**	**18**	**45**

Both of the pre-construction sites visited were compliant compared to the active and post construction development phases (Table 2). Of the sites visited in active construction, 55% were compliant. For those where construction was completed, 64% were compliant. None of the sites visited in the post-construction stage had received a post-development report as required by the regulation.

Table 2. Compliance of development sites by development phase

Development Phase	Total	# Compliant
Pre construction	2	2
Active Construction	29	16
Post Construction	14	9
Total	**45**	**27**

Figure 2. Frequency and types of non-compliance for the B.C. Mainland

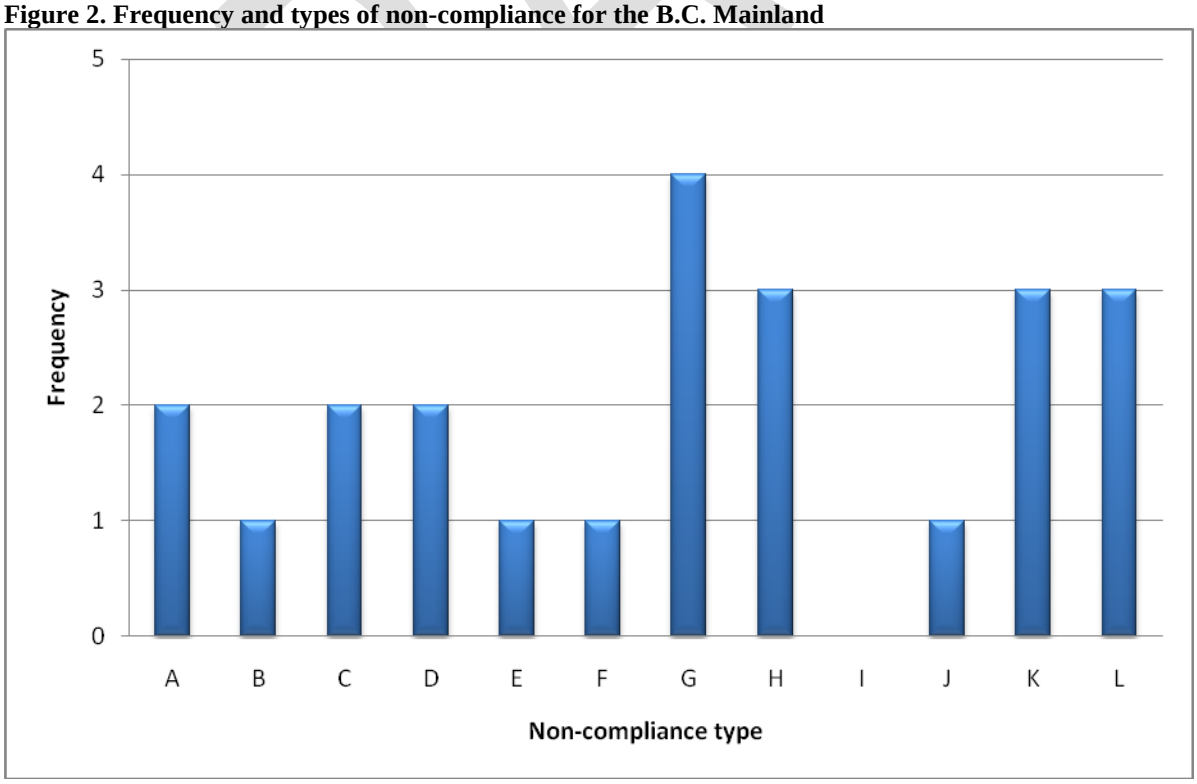


Figure 2 shows the types of non-compliance found in the 2007 samples. These types of non-compliance could be attributed to the QEP, the developer or both depending on the circumstance. The following provides detail of specific circumstances of the non-compliance situations. Brackets indicate who the non-compliance could be attributable to.

A: SPEA not marked; development encroached

1) the developer had removed the SPEA markings and put lawn within 6m of HWM (Developer)
2) Minor temporary encroachment, SPEA not marked during active construction (Developer)

B: SPEA not marked; no encroachment

1) SPEA not marked during active construction, no encroachment (Developer)

C: SPEA calculated incorrectly, development encroached

1) QEP recommended smaller SPEA than RAR result, development encroached, no riparian damage (QEP, Developer)
2) Channel width incorrect causing 2m reduction in SPEA, road encroached by 2m (QEP)

D: SPEA calculated incorrectly, no encroachment

1) Channel width incorrect but no difference to SPEA (minimum applied) (QEP)
2) Channel width incorrect leading to 6m difference in SPEA. No new impact due to presence of existing trail (QEP).

E: SPEA marked correctly, development encroached

1) SPEA was originally marked, flagging removed. Developer encroached by 5m (Developer)

F: Report not accepted, development occurring

1) Report had not been properly uploaded to notification system, development proceeded (local government)

G: Watercourses present on property not addressed in QEP report (QEP)

H: SPEA marked incorrectly, development encroached

1) SPEA marked with silt fencing at 11.5 m- should be at 15m. Development encroached 1.5 m (Developer)
2) Variance granted from 23m SPEA to 10m SPEA, deck encroached to 9m; SPEA not marked, construction materials stockpiled in SPEA (Developer).
3) SPEA width not consistent, minor encroachment by trail and recreational equipment

I: SPEA marked incorrectly, no encroachment

J: No requirement for post-construction report (QEP)

K: Measures were not sufficiently detailed (QEP)

L: Measures not followed (Developer)

Figure 3. Non-compliance situations attributable to QEPs and Developers

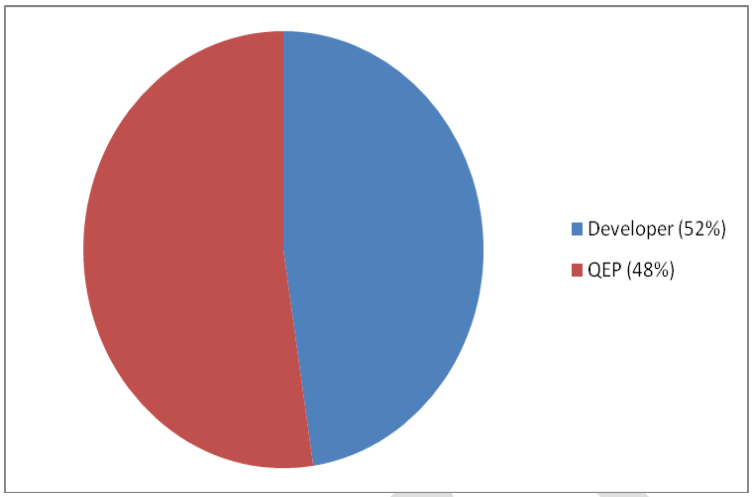


Figure 3. shows the proportion of non-compliance occurrences attributable to QEP and developer. Developers were responsible for 52% of the non-compliance situations, QEPs were responsible for 48% of the non-compliance situations.

Figure 4. Professional designations of primary QEPs in the sites monitored for 2007

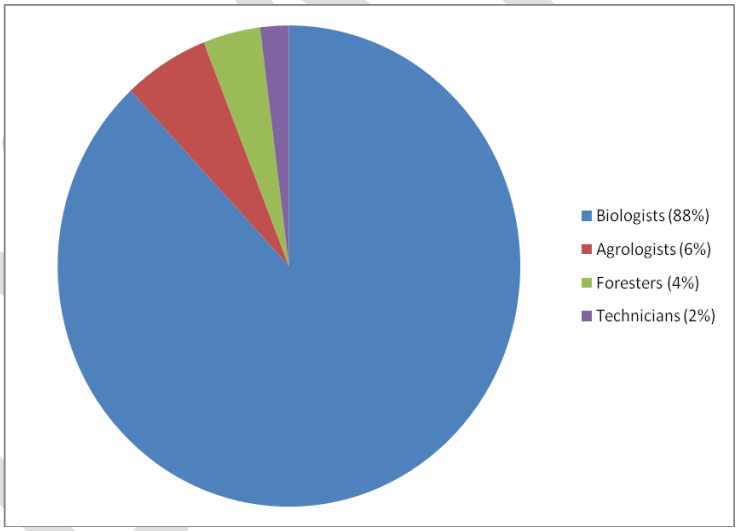


Figure 4. shows the breakdown of primary QEPs for the sites visited. Biologists formed the majority of primary QEPs (88%) followed by Agrologists (6%), Foresters (4%), and Technicians (2%).

3.2 Vancouver Island

In the summer of 2008, the Vancouver Island Region of the Environmental Stewardship Division (ESD) entered into a monitoring project with the Coast Division of the

Conservation Officer Service (COS). The objective of the project was to assess the regulatory compliance of land developers in applying the RAR on development sites. The inspections involved the assessment of various types of development (Table 3). Inspections of residential house construction projects were visited the most, followed by sites that were identified as new subdivision developments.

Table 3. Types of development and number of inspections for assessments submitted in 2007

Type of Development	Number of Sites Inspected	Development listed as 'New' or 'Redevelopment'
Trails	1	1 - new
Deck Construction	2	2 - redevelopments
Accessory Building	4	2 - new 2 – redevelopment
Residential/Commercial Construction	27	20- new 7 - redevelopment
Landscaping	2	1- new 1 – redevelopment
Danger Tree	1	1 - new
Strata Development	3	3- new
Subdivision	23	23 - new
Total	63	

From the 63 sites inspected, a total of 24 were considered to be compliant with the RAR while 39 sites were determined to be non-compliant with RAR.

The categories of non compliance for this report are found in Table 4. The most common compliance issue in 2008 is failure to mark SPEA.

Table 4. Types of non-compliance identified during RAR inspections

Non-compliance Type	Frequency
SPEA not marked	33
Streams not previously reported located on site	7
Vegetation clearing/tree removal	6
New grass lawns	6
Poor sediment control	6
Buildings	5
Soil disturbance/rock depositions/septic field development	5
Road/Driveway crossing	3
Parking lot development	2
Trails	2
Firepits	2

Deck construction	1

When assessing compliance based on the stage of development, only 23% of sites were identified as "post construction", while 41% were "active construction" and 35% were "pre-construction" - not subject to any construction at the time of inspection (Table 4). In this assessment, pre-construction non-compliance could include vegetation clearing, tree removal or other forms of development that did not include permanent structures.

Table 5. Compliance of development sites with RAR reports by development stage

Development Stage	Total	Compliant	Non Compliance	
			Other non Compliance to SPEA	Encroachment in SPEA
Pre construction	22	6	14	2
Active Construction	26	12	7	7
Post Construction	15	6	6	3
Total	**63**	**24**	**27**	**12**

For the sites categorized as **Pre construction**, 73% were non compliant, primarily associated with not marking the SPEA on the ground. However, since the SPEA is not required to be marked until the development begins, there is an opportunity for some of these sites to become compliant before construction starts. The two encroachment sites were associated with residential development sites where car parking or logging within the SPEA were identified.

For sites that we identified as **Active Construction**, approximately 50% of the sites were seen as compliant. SPEA marking remains the biggest error in the non compliant category, with the more serious encroachment sites showing deposition of fill, improper siting of buildings and clearing of vegetation/trees inside the SPEA. It is the responsibility of the developer to ensure that a surveyor has properly marked the SPEA prior to development.

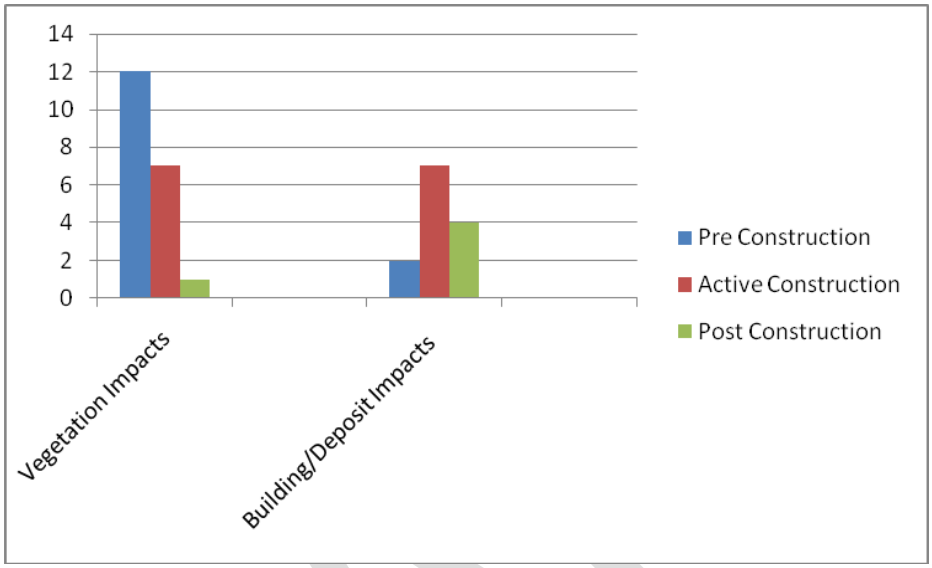
Non compliance of **Post Construction** sites was 60%, which was heavily influenced by lack of SPEA marking on the ground. There is a requirement for the SPEA to be permanently marked either by signage, fencing or other markings to ensure that future owners are aware of the SPEA. Significant encroachments of fill were identified on three sites (comprising an area of 100 sq meters or more).

Fifteen sites were recommended by the COS as needing follow-up inspections to ensure the issue(s) were corrected. In the opinion of a Conservation Officer, there was one site where a Harmful Alteration Disruption or Destruction (HADD) as per Section 35 of the *Fisheries Act* had occurred.

Approximately half of the 63 development sites inspected did not have a SPEA marked on the ground. In the 33 cases where a SPEA marking was not present, 20 sites had

impacts limited to the manipulation of riparian vegetation (e.g. trails, vegetation clearing). On 13 sites, the impacts to the SPEA from the development were more substantial (e.g. soil deposit and building encroachment) (Fig 5).

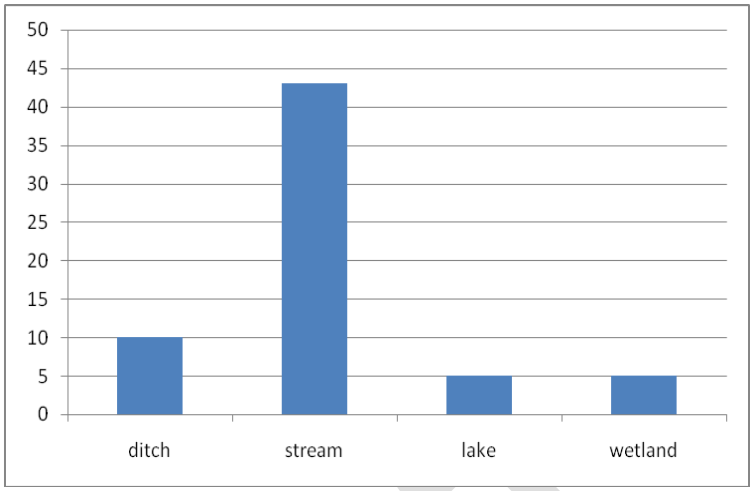
Figure 5. SPEA impacts by development phase



Where SPEA's were clearly marked (n=30) there were no (significant) encroachment issues. The most common method used to mark the SPEA was with the use of flagging tape. During the active construction phase we observed snow fencing on several development sites. On two post development sites the SPEA was visibly marked with legal boundary pins and a rock wall.

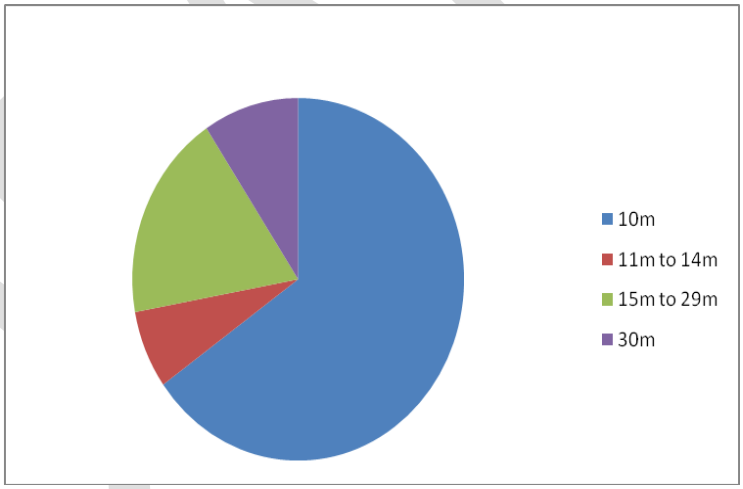
Streams were the dominant watercourse type, found on 43 sites, followed by ditches on 10 sites, lakes on 5 sites and wetland conditions on 5 sites (Figure 6).

Figure 6. Physical watercourse conditions sampled in 2008



In reviewing the reports selected for monitoring, it was noted that two-thirds of the reports submitted for streams recommended SPEA widths of 10 meters (Figure 7). The site inspections noted that 70 percent of these small streams were dry in the summer of 2008.

Figure 7. Reported SPEA widths for streams (n=43)



In assessing compliance by watercourse type, we looked at only those development projects where a single watercourse type dominated to provide the following compliance rates:
Streams - 37% compliant; Ditches - 57%; Wetlands - 50%; Lakes - 0%

Where SPEAs were marked in the field, we measured them to determine if the widths in the report were reflected on the site. We found that 50 percent of the reports for streams were accurate in the field, 43 percent of reports for ditches, and 60 percent of wetlands. There were no lakes with marked SPEAs in our sample.

Appendix 1: Example Sample Plans for Monitoring Compliance with the BC Riparian Area Regulation

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Single Sampling Plan

The following tables provide sample sizes that would be required to ensure with 90% confidence that no more than the given percentage of assessments in the lot will be defective if no more than C defective assessment plans are found in the sample. For each of lot sizes 200, 300, 400, and 500, sample sizes are provided for values of C ranging from 0 to 5 and for maximum percentage defective (LTPD) equal to 0.1, 0.5, 1.0, 2.0 3.0, 4.0, 5.0, and 10.0 percent.

In addition, the probability of erroneously rejecting the lot is provided in parentheses for each sample size; these probabilities are calculated assuming that the actual %defective in the lot is half of the maximum percentage defective used to calculate the sample size. As n and C increase, the risk of making a false positive error (erroneously rejecting the lot) decreases. (The use of half of the maximum percentage defective as the actual %defective in calculating the probability of erroneously rejecting the lot was an arbitrary choice for the purpose of example.)

For example, for a lot size of 200, if 89 plans are sampled and 2 or fewer plans are found to be defective, then it can be stated with 90% confidence that no more than 5.0% of the lot is defective. However, assuming that 2.5% (= ½*5.0%) of the plans in the lot are actually defective, there is a 40% chance of erroneously rejecting the lot (i.e. committing a Type I (false positive) error) and concluding that the actual error rate is more than 10%.

Given that all combinations of n and C in these tables ensure that you are 90% confident that the LTPD is the stated maximum percentage or less, the choice of sample size and C will depend on what level of false positive results is acceptable. An acceptable false positive rate depends on the cost of erroneously rejecting a lot.

Consider your likely lot size and your expected rate of defectives based on past experience. If you reject a lot (which is a set of assessment plans for a target time period), will the defective plans in the sample provide you sufficient insight into chronic or widespread problems, or will you need to inspect all of the assessment plans for that time period?

Double Sampling Plan

A double sampling plan is a possible alternative to the single sampling plan. In such a plan, the lot can be accepted if the number of defects in the initial sample is C1 or less or rejected if the number of defects is C2 or more. In these situations, no further sampling is required. However, if the number of defects is between C1 and C2, then another sample is drawn and inspected. The combined number of defectives from the two samples is then used to determine if the lot is accepted or rejected. Assuming you plan to inspect additional assessment plans if a lot is rejected, this scheme may reduce the overall inspection. Examples and further detail can be provided if you are interested in exploring this possibility.

LTPD Sample Sizes: Minimum Number of Assessments to be Randomly Sampled for the Target Period

(Probability (%) of Rejecting the Lot Given the Sample Size and Given %Actually Defective = Half of the Maximum % Assumed to be Defective)

Table 1. Lot Size: Total Number of Assessment Plans in Target Period=200

Acceptance # □(C)	Max 0.1 % □Defective	Max 0.5 % □Defective	Max 1.0 % □Defective	Max 2.0 % □Defective	Max 3.0 % □Defective	Max 4.0 % □Defective	Max 5.0 % □Defective	Max 10.0% □Defective
0	180 (90%)	180 (90%)	137 (69%)	87 (68%)	63 (68%)	50 (69%)	41 (69%)	21 (68%)
1	199 (0%)	199 (0%)	190 (0%)	136 (46%)	102 (52%)	81 (53%)	67 (54%)	35 (55%)
2	. (.%)	. (.%)	198 (.%)	172 (0%)	133 (29%)	107 (37%)	89 (40%)	48 (45%)
3	. (.%)	. (.%)	. (.%)	195 (.%)	160 (0%)	131 (18%)	110 (25%)	60 (35%)
4	. (.%)	. (.%)	. (.%)	196 (.%)	182 (.%)	152 (0%)	129 (11%)	71 (25%)
5	. (.%)	. (.%)	. (.%)	. (.%)	195 (.%)	171 (.%)	146 (0%)	82 (18%)

Table 2. Lot Size: Total Number of Assessment Plans in Target Period=300

Acceptance # □(C)	Max 0.1 % □Defective	Max 0.5 % □Defective	Max 1.0 % □Defective	Max 2.0 % □Defective	Max 3.0 % □Defective	Max 4.0 % □Defective	Max 5.0 % □Defective	Max 10.0% □Defective
0	270 (90%)	205 (68%)	161 (79%)	95 (68%)	67 (72%)	52 (68%)	42 (71%)	22 (69%)
1	299 (0%)	285 (0%)	241 (64%)	153 (52%)	110 (60%)	86 (55%)	70 (59%)	36 (56%)
2	. (.%)	298 (.%)	290 (0%)	200 (29%)	147 (48%)	115 (42%)	94 (48%)	49 (46%)
3	. (.%)	. (.%)	297 (.%)	240 (0%)	179 (33%)	142 (29%)	117 (38%)	62 (38%)
4	. (.%)	. (.%)	. (.%)	272 (.%)	209 (16%)	167 (17%)	138 (28%)	74 (30%)
5	. (.%)	. (.%)	. (.%)	295 (.%)	237 (0%)	191 (6%)	159 (18%)	85 (23%)

Table 3. Lot Size: Total Number of Assessment Plans in Target Period=400

Acceptance # □(C)	Max 0.1 % □Defective	Max 0.5 % □Defective	Max 1.0 % □Defective	Max 2.0 % □Defective	Max 3.0 % □Defective	Max 4.0 % □Defective	Max 5.0 % □Defective	Max 10.0% □Defective
0	361 (90%)	274 (69%)	175 (68%)	100 (69%)	69 (68%)	53 (68%)	43 (68%)	22 (69%)
1	399 (0%)	380 (0%)	272 (46%)	162 (53%)	114 (55%)	88 (56%)	72 (56%)	37 (57%)
2	. (.%)	398 (.%)	343 (0%)	215 (37%)	154 (42%)	119 (44%)	97 (45%)	50 (47%)
3	. (.%)	. (.%)	390 (.%)	262 (18%)	189 (29%)	148 (34%)	121 (36%)	63 (39%)
4	. (.%)	. (.%)	396 (.%)	304 (0%)	223 (17%)	175 (23%)	143 (26%)	75 (31%)
5	. (.%)	. (.%)	. (.%)	341 (.%)	255 (7%)	201 (15%)	165 (18%)	87 (25%)

Table 4. Lot Size: Total Number of Assessment Plans in Target Period=500

Acceptance # □(C)	Max 0.1 % □Defective	Max 0.5 % □Defective	Max 1.0 % □Defective	Max 2.0 % □Defective	Max 3.0 % □Defective	Max 4.0 % □Defective	Max 5.0 % □Defective	Max 10.0% □Defective
0	450 (90%)	268 (79%)	184 (75%)	102 (68%)	71 (71%)	54 (68%)	43 (69%)	22 (68%)
1	499 (0%)	402 (65%)	292 (63%)	168 (55%)	117 (59%)	90 (56%)	73 (59%)	37 (57%)
2	. (.%)	483 (0%)	377 (43%)	224 (40%)	158 (49%)	122 (46%)	99 (49%)	50 (47%)
3	. (.%)	497 (.%)	444 (0%)	275 (26%)	196 (39%)	151 (35%)	123 (40%)	63 (39%)
4	. (.%)	. (.%)	490 (.%)	322 (11%)	231 (28%)	179 (26%)	146 (32%)	75 (32%)
5	. (.%)	. (.%)	495 (.%)	366 (0%)	265 (19%)	206 (18%)	169 (25%)	87 (26%)

Appendix 2: Compliance with the Reporting and Implementation Requirements of the BC Riparian Areas Regulation (RAR)

Assessment #:	MOE Region:
Date:	Weather (past 24 hours):
Monitored by:	

Attendance during site visit:

☐	QEP Name:
☐	Developer Name:
☐	Municipality:

Summary of Site Check:

☐ Compliant

☐ Non-compliant ☐ Encroachment/damage ☐ Other

Reason for Non-Compliance:

☐ SPEA not marked, development encroached
☐ SPEA not marked, no encroachment
☐ SPEA calculated incorrectly, development encroached
☐ SPEA calculated incorrectly, no encroachment
☐ SPEA marked correctly, development encroached
☐ Report rejected, development occurring
☐ Watercourses present on property not addressed in QEP report
☐ SPEA calculated incorrectly- fish presence
☐ SPEA calculated incorrectly- stream permanence
☐ SPEA calculated incorrectly- Potential Vegetation Category
☐ SPEA marked incorrectly, development encroached
☐ SPEA marked incorrectly, no encroachment
☐ Other (describe)

Construction Stage:

☐ Active Construction ☐ Post-construction ☐ N/A (subdivision/rezoning)

Section 2 - Field Check of Information for RAR Assessments

Simple Assessments

	Reported	Field Check	Accuracy (Y/N/NA)
Stream Type (stream, wetland, lake,)			
Stream Permanence (check if default not used, is there flow in the channel currently?)			
Fish Presence(check if default not used-follow up fish sampling)			
Riparian Width from Top of bank (m, ± 1SD)			
SPEA Width from Top of the Bank (m)			

Summary				
Was the SPEA calculated correctly? If no, indicate reason:	Yes	☐	No	☐
Was the SPEA marked correctly on the ground? If no, indicate problem:	Yes	☐	No	☐
Is the site compliant with RAR methodology? If no, please indicate reason below:	Yes	☐	No	☐

Note/comments, sketches:

Detailed Assessments

	Reported	Field Check	Accuracy
Habitat Type (stream, wetland, lake, ditch)			☐Y ☐N ☐N/A

	Channel Width Check (m)				Gradient Check (%)		
Reach #				Reach			
Starting Point							
				Upstream			
				Downstream			
Total							
Average (field)				Average (field)			
Average (reported)				Average (reported)			

Channel Type

Field		**Reported**		**Accuracy**	**☐Y ☐N ☐N/A**
Reason if 'N'	**☐Incorrect BFW**	**☐Incorrect gradient**	**☐Calculation error**	**☐Other**	

Site Potential Vegetation Type (SPVT)

	Yes	No	
SPVT Polygons	☐	☐	Tick yes only if multiple polygons, if No then fill in one set of SPVT data boxes

Polygon No: ☐

	LC	SH	TR
SPVT Type	☐	☐	☐

Method employed if other than TR

Polygon No: ☐

	LC	SH	TR
SPVT Type	☐	☐	☐

Method employed if other than TR

Zone of Sensitivity (ZOS) and resultant SPEA

Reach No:		If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons
Segment No:		
LWD, Bank and Channel		

Stability ZOS (m)								
Litter fall and insect drop ZOS (m)								
Shade ZOS (m) max		South bank	Yes	☐	No	☐		
Ditch	Justification description for classifying as a ditch (manmade, no significant headwaters or springs, seasonal flow)							
Ditch Fish Bearing	Yes	☐	No	☐	If non-fish bearing insert no fish bearing status report			
SPEA maximum		(For ditch use table3-7)						

Reach No: Segment No:		If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons						
LWD, Bank and Channel Stability ZOS (m)								
Litter fall and insect drop ZOS (m)								
Shade ZOS (m) max		South bank	Yes	☐	No	☐		
SPEA maximum		(For ditch use table3-7)						

Reach No: Segment No:		If two sides of a stream involved, each side is a separate segment. For all water bodies multiple segments occur where there are multiple SPVT polygons						
LWD, Bank and Channel Stability ZOS (m)								
Litter fall and insect drop ZOS (m)								
Shade ZOS (m) max		South bank	Yes	☐	No	☐		
SPEA Maximum		(For ditch use table3-7)						

Summary				
Was the SPEA calculated correctly? If no, indicate reason:	Yes	☐	No	☐
Was the SPEA marked correctly on the ground? If no, indicate problem:	Yes	☐	No	☐
Is the site compliant with RAR methodology? If no, please indicate reason below:	Yes	☐	No	☐

Comments/sketches:

Section 3 - Field Check of Measures to Protect and Enhance the SPEA

Measure: Hazard Trees			
Is measure sufficiently detailed?	Y ☐	N ☐	NA ☐
Is rationale for no measure appropriate?	Y ☐	N ☐	NA ☐
Was the measure proposed followed?	Y ☐	N ☐	NA ☐
Has the measure been so far effective in protecting the SPEA? ()-, ,	Y ☐	N ☐	NA ☐
Is there a Hazard Tree Assessment for each tree removed?	Y ☐	N ☐	NA ☐
Does the number of trees removed comply with assessment report?	Y ☐	N ☐	NA ☐
Has there been replanting?	Y ☐	N ☐	NA ☐
Have the removed trees been left on the ground?	Y ☐	N ☐	NA ☐
How many trees have been removed?			
What percent of the stand has been removed?			
Comments/Notes/Sketch/Photo			

Measure: Windthrow			
Is measure sufficiently detailed?	Y ☐	N ☐	NA ☐
Is rationale for no measure appropriate?	Y ☐	N ☐	NA ☐
Was the measure proposed followed?	Y ☐	N ☐	NA ☐
Has the measure been so far effective in protecting the SPEA? (Is there windthrow)	Y ☐	N ☐	NA ☐
Have windthrow measures been implemented within the SPEA?	Y ☐	N ☐	NA ☐
Comments/Notes/Sketch/Photo			

Measure: Slope Stability			
Is measure sufficiently detailed?	Y ☐	N ☐	NA ☐
Is rationale for no measure appropriate?(are slope stability indicators present)	Y ☐	N ☐	NA ☐
Was the measure proposed followed?	Y ☐	N ☐	NA ☐
Has the measure been so far effective in protecting the SPEA? (have slopes destabilized recently)	Y ☐	N ☐	NA ☐
Comments/Notes/Sketch/Photo			

Measure: Protection of Trees in SPEA			
Is measure sufficiently detailed?	Y ☐	N ☐	NA ☐
Is rationale for no measure appropriate?	Y ☐	N ☐	NA ☐
Was the measure proposed followed?	Y ☐	N ☐	NA ☐
Has the measure been so far effective in protecting the SPEA? (Is there any development in the rooting zone/drip zone)	Y ☐	N ☐	NA ☐
Comments/Notes/Sketch/Photo			

Measure: Preventing Encroachment in the SPEA			
Is measure sufficiently detailed?	Y ☐	N ☐	NA ☐
Is rationale for no measure appropriate?	Y ☐	N ☐	NA ☐
Was the measure proposed followed?	Y ☐	N ☐	NA ☐
Has the measure been so far effective in protecting the SPEA? (Are there indications of recent encroachment-describe/photo)	Y ☐	N ☐	NA ☐
Comments/Notes/Sketch/Photo			

Measure: Sediment and Erosion Control			
Is measure sufficiently detailed?	Y ☐	N ☐	NA ☐
Is rationale for no measure appropriate?	Y ☐	N ☐	NA ☐
Was the measure proposed followed?	Y ☐	N ☐	NA ☐
Has the measure been so far effective in protecting the SPEA? Are there indications of sediment/erosion within the SPEA and stream bed	Y ☐	N ☐	NA ☐
Comments/Notes/Sketch/Photo			

Measure: Storm Water Management			
Is measure sufficiently detailed?	Y ☐	N ☐	NA ☐
Is rationale for no measure appropriate?	Y ☐	N ☐	NA ☐
Was the measure proposed followed?	Y ☐	N ☐	NA ☐
Comments/Notes/Sketch/Photo			

Measure: Floodplain Concerns			
Is measure sufficiently detailed?	Y ☐	N ☐	NA ☐
Is rationale for no measure appropriate?(Is this an active channel?)	Y ☐	N ☐	NA ☐
Was the measure proposed followed?	Y ☐	N ☐	NA ☐
Has the measure been so far effective in protecting the SPEA? (has there been substantive lateral bank movement?)	Y ☐	N ☐	NA ☐
Comments/Notes/Sketch/Photo			

Section 4 – Field Check of Post Development Conditions

To be completed if post-development report submitted

Construction completion date.			
Was the requirement for a Post Construction Report clearly stated in the Assessment Report?	Y ☐	N ☐	NA ☐
Post Construction Report date.			
Does the Post-Construction Report describe site conditions? If not, describe.	Y ☐	N ☐	NA ☐
Is the SPEA as described? If not, describe.(If there has been encroachment, describe extent)	Y ☐	N ☐	NA ☐
Was the construction phase free of problems? If "No" describe problems noted during construction.	Y ☐	N ☐	NA ☐
Was a HADD avoided? If "No" describe (indicate if damage to the SPEA has occurred)	Y ☐	N ☐	NA ☐
Was Net Loss of Fish Habitat or Riparian Area avoided? If "No" describe. (If the SPEA has been encroached into, was there a functional riparian zone prior to development?)	Y ☐	N ☐	NA ☐

Were any innovative practices followed or attempted? If “Yes” describe.	Y ☐	N ☐	NA ☐

Pictures:
Assessment #:

Picture 1:

Picture 2:

Picture 3:

Picture 4:

Picture 5:

Picture 6:

Picture 7:

Picture 8: