

26 June 2003
Reference: 1922.01

Benson R. Gould, LSP, LEP
CMG Environmental, Inc.
600 Charlton Street
Southbridge, MA 01550



Dear Ben:

I have responded to your comments in your 25 June 2003 email regarding ERM's proposed verification sampling plan for the wetlands remediation project at the former Raytheon facility in Wayland, Massachusetts (Figure 1). Your comments are in italics.

As promised, I have taken another look at the "Verification Sampling" section (4.3.1) of the December 30, 2002 "Phase IV Remedy Implementation Plan" for the former Raytheon facility at 430 Boston Post Road in Wayland. I compared this text to the EPA regulations concerning PCB remediation waste promulgated at 40 CFR 761. Much of the verification sampling outlined in the Phase IV report is consistent with the regulation. However, I would like to mention three inconsistencies:

§761.283(b)(2) specifies that sampling points must be 1.5 meters apart, and ERM has indicated all along that you intend to collect nine-point composites from a grid that is 20×20 feet square. Have you received a specific variance for this from EPA? I am not arguing that you should use the 3-meter grid squares. As shown on the attached PowerPoint file, this would result in ~316 composite bottom samples for closure (most, but not all, would be 9-point composites). Figure 14 in the Phase IV report illustrates ~187 composite sampling locations (if my count is correct), which to me seems adequate to provide good statistics on post-remediation excavation bottom samples.

Subpart O, §761.280, outlines verification sampling requirements for Self-Implementing Cleanup Activities. ERM is conducting the cleanup activities under the §761.61(c) Risk Based Disposal Approval, which allows for proposal of alternative methods for sampling, cleanup or disposal of PCB remediation waste. The verification-sampling plan that was submitted to the EPA proposes the grid spacing of 20x20 foot spacing, with nine point sample composites. This was based on conversations with EPA during our preliminary permit meetings. The EPA agreed that it would be appropriate for ERM to propose alternate

spacing of the grid to suit the Site characteristics. We are glad to hear you are in agreement with our spacing proposal. In the end, it will up the EPA if they agree with our proposed plan.

For reasons that are opaque to me, §761.283(b)(1)(i) requires that you orient the sampling grid to magnetic north. All the remediation figures I recall seeing are oriented to true north. (In the attached PowerPoint file, I followed the magnetic north procedure.)

Although the strict requirements of this section does not apply to Raytheon's application, yes, we were also aware of this oddity in the regulation and have since revised all of our Site figure to be oriented to magnetic north.

On page 52 of the Phase IV report, ERM states that "perimeter sample points in excess of 50 ppm total PCBs will be evaluated for additional action." This suggests two things to me - first, that you do not plan on evaluating perimeter sample points that exhibit less than 50 ppm total PCBs; and second, that you are not committing to removal of additional sediment, even if the perimeter sample exceeds 50 ppm. §761.61(a)(4)(i) provides specific guidance values for PCB cleanup levels. I presume that the Site wetlands meet the regulatory definition of a 'low occupancy area.' Therefore, ¶(B) of the cited regulation indicates you cannot leave more than 25 ppm total PCBs in place without some action; at levels up to 50 ppm, the area must be fenced and posted with signs that include the "M_L" labeling prescribed in §761.45(a); at levels up to 100 ppm, the Site must be capped in accordance with §761.61(a)(7) & (8). Please comment on how you reconcile the Phase IV with these regulations.

The intent of the language in the Phase IV is that ERM will remove any area where 50 ppm PCBs is detected in sediment during the perimeter sampling activities.

§761.61 (a) does not apply to projects conducted in sediment. §761.61 (a) (1) (B) is intended for projects performed under presumptive approval. §761.61(c) Risk Based Disposal Approval, applies to the project application submitted to the EPA. In the language of section (c) it states "Any person wishing to sample, cleanup or dispose of PCB remediation waste in a manner other than that described in paragraphs (a) and (b) of this section,". ERM in its application "Risk-Based Disapproval Application, Former Raytheon Facility, Boston Post Road, Wayland, Massachusetts," dated 23 December 2002, Section 6 describes the proposed approach to sample, cleanup and dispose of PCB waste.

I am also confused regarding the plan for averaging perimeter samples, which perhaps you can clarify for me—

I am not sure whether ERM intends to group post-excavation perimeter closure samples with (or into) the grid section bottom samples (i.e., the 9-point composites) where a partial grid encompasses a perimeter sample point. Section 4.3.1 (page 51) says that ERM will average samples “in those grid cells with more than one sample (i.e. perimeter samples or duplicates).” Section 4.3.2 (pages 52-53) discusses perimeter sampling, including comparison of the arithmetic mean perimeter concentration to certain threshold value (20.0 ppm). To me, this implies you will not lump the perimeter samples in with the grid composites.

§761.289(b)(1)(i) specifies one must “take all samples in the composite at the same depth.” At our meetings, ERM has consistently stated that the perimeter samples will be collected from the uppermost six inches of sediment beneath leaf litter. Since you are proposing sediment excavation to a depth of 18 inches, this appears to preclude compositing bottom samples and perimeter samples. I do not believe the regulation specifically prohibits averaging individually-analyzed perimeter samples with the bottom grid composites (for statistical analysis measuring remediation success). However, I do not recommend such averaging, as it would likely obscure the relative merits of further remediation at a particular point versus remediation confirmation.

Perimeter samples will be discrete samples and will not be averaged with grid composite samples. It has been our intent to take these discrete samples from a depth of 6-12”, which is representative of the contaminant location detected in the characterization sampling conducted at the Site.

On final point is perimeter sampling. I measure the mapped excavation perimeter (in the primary planned remediation area) as 1,240 feet long. No doubt actual excavation would form a more regular geometry (and hence a shorter perimeter), but this number does not include the perimeter of the outlying planned remediation area. Therefore, I presume my measurement is a fair representation of the total perimeter length. ERM proposes collecting samples from “10 pre-determined locations on the perimeter of the remediation area.” That is only one sample per 124 linear feet of excavation sidewall. If you are able to maintain vertical cuts in the undisturbed sediment (unlikely, given its wetness), 18 inches of excavation would yield an exposed area along the remediation perimeter of ~1,860 square feet. EPA regulations specify one sample per square meter (10.8 square feet) in the remediation area. Sampling at the same

relative frequency along the excavation perimeter would yield ± 173 individual sample points. Even if you grouped these into composites of nine samples each, this would provide ± 19 samples (however, §761.289(b)(1)(i) specifies a maximum dimension of 3 meters for compositing areas, which leads to ± 58 points).

Subject to EPA approval, I recommend collecting discrete samples every 10 feet along the excavation perimeter, and compositing each sequence of three points. That would yield ± 124 individual samples and ± 42 two- or three-point composites. In the spirit of §761.283(a), I would also caveat that if ERM intends to conduct additional manual remediation of isolated areas, you collect no fewer than three perimeter samples (as well as no fewer than three bottom samples), regardless of overall excavation size or compositing strategy.

If you do go with ± 42 perimeter composite samples, then I believe you should revise your estimate that the average perimeter sample concentration cannot exceed 20.0 ppm downward by approximately a factor of four, to 5 ppm. Furthermore, to ensure (with 95% confidence) that no single sample point exceeds 50 ppm, I recommend a ceiling limit of 10 ppm (average) total PCB for any three-point composite.

The purpose of the Risk-Based Disposal Approval Application (§761.61 (c)) is to present variations in EPA Self-Implementing Disposal (§761.61 (a)) or Performance-Based Disposal (§761.61 (b)). Subpart O, §761.280, outlines verification sampling requirements for Self-Implementing Cleanup Activities. ERM is conducting the cleanup activities under the §761.61(c) Risk Based Disposal Approval, which allows for proposal of alternative methods for sampling, cleanup or disposal of PCB remediation waste.

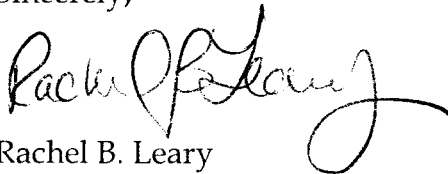
The intent of the perimeter sampling is to address the town's concerns with the western boundary of the area to be excavated. To clarify, it is not ERM's intent to evaluate the entire perimeter of the excavation (1,140 ft) as the characterization work performed to date does not warrant further evaluation to the northern, southern and eastern edges of the area to be excavated. The proposed western edge of the perimeter is 536 feet in length (Figure 2). Therefore, ERM proposes to collect perimeter samples along the western boundary of the excavation area at 25 predetermined perimeter sampling grids at the mid-point of each grid wall at a depth of 6-12". These 25 discrete samples will be averaged. If the average exceeds 8 ppm, the cleanup goal of 2 ppm PCBs will not be met. If the cleanup goal is not met, ERM will excavate side-walls of the grids of the highest PCB concentrations until the cleanup goal is met.

In addition, ERM will compare each individual perimeter sample with the PCB concentrations at the adjacent western sample location from the characterization analytical data. If the perimeter sample exceeds the value of the adjacent transect value, the excavation will be extended in that area and re-sampled until the value is equal to or less than that of the adjacent transect value.

If ERM conducts additional manual remediation of isolated areas, ERM will collect no fewer than three perimeter samples to be averaged and no fewer than three bottom samples to be averaged, regardless of overall excavation size or compositing strategy.

If you have any further questions please contact me at (617) 646-7841. I look forward to seeing you tonight at the Town of Wayland's Conservation Commission meeting at the town building.

Sincerely,

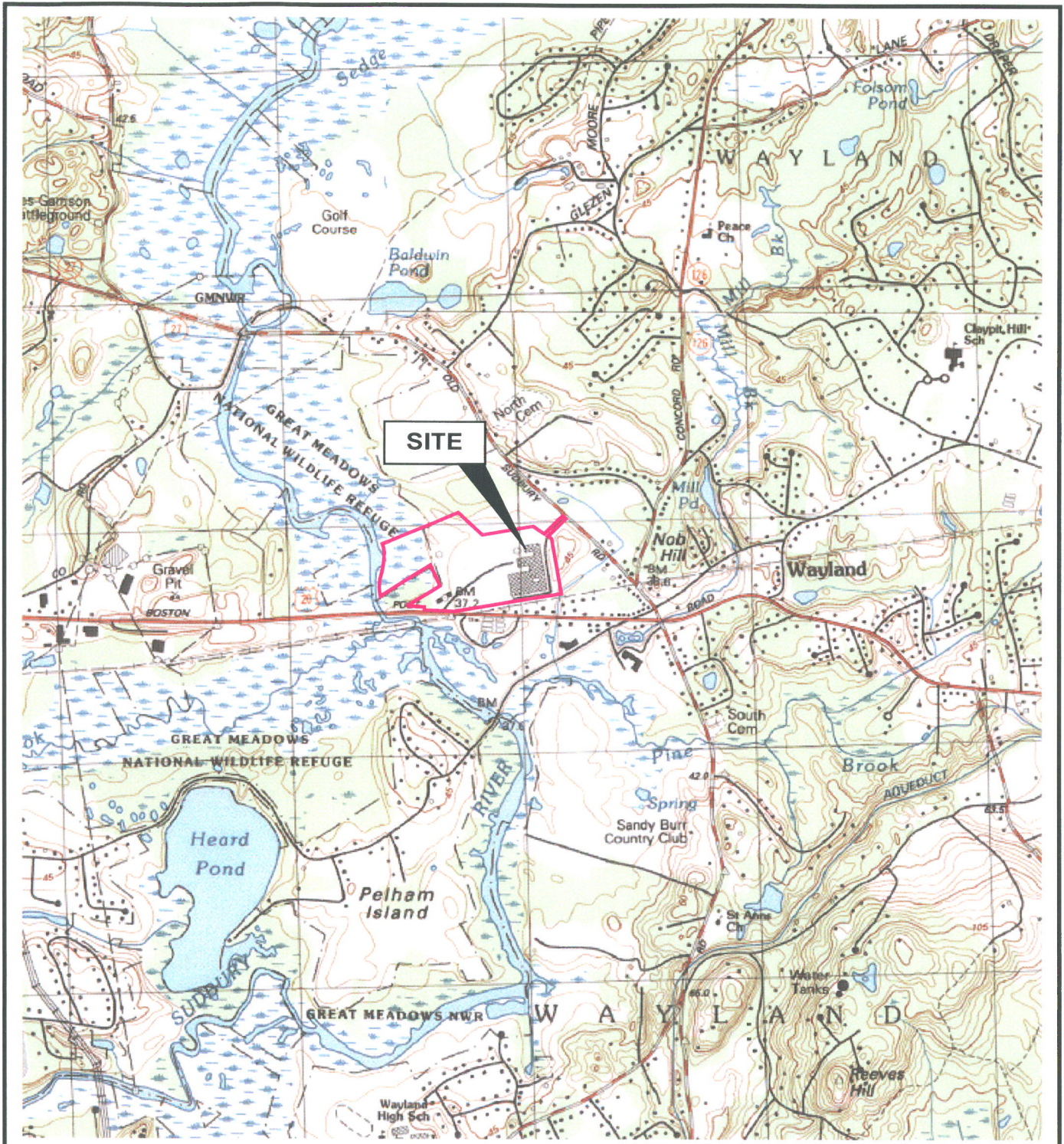
A handwritten signature in black ink, appearing to read "Rachel B. Leary". The signature is fluid and cursive, with a long, sweeping tail on the final letter.

Rachel B. Leary
Project Manager

rbl

enclosures: Figure 1 - Site Locus

Figure 2 - Verification Grid



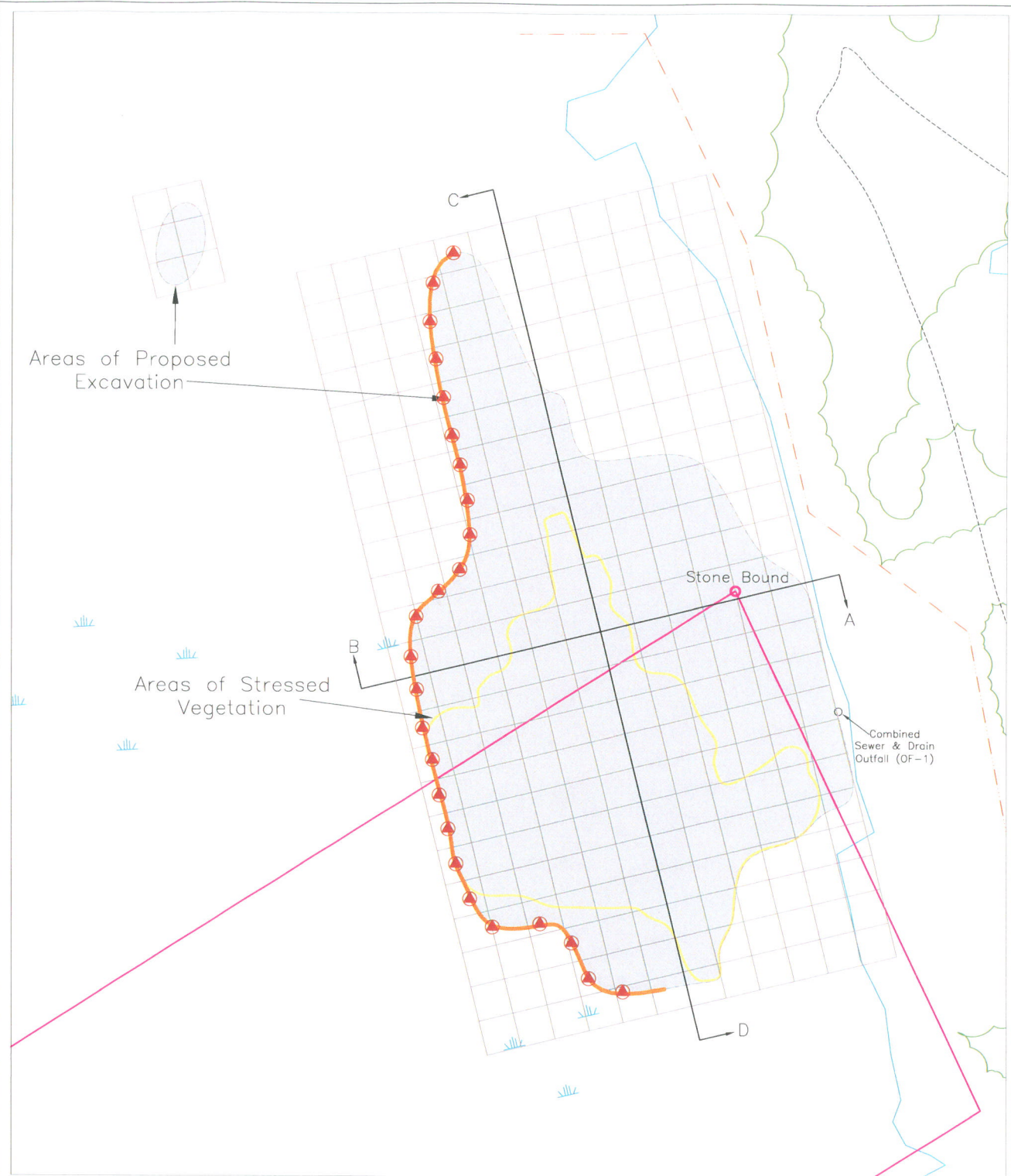
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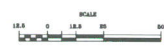
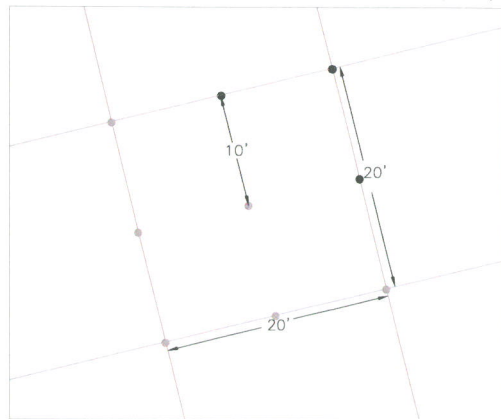
Legend	
	Property Boundary



ENVIRONMENTAL RESOURCES MANAGEMENT 399 Boylston Street, Boston, Massachusetts 02116 (617) 267-8377			
CLIENT NAME:	Raytheon	DRAWN BY:	JE
FILE NAME:	Locus Map	SCALE:	1:25,000
		DATE:	4/17/03
		PROJ:	1922.03
Former Raytheon Facility 430 Boston Post Road Wayland, Massachusetts			
Locus Map			FIGURE NO.: 1
PRINCIPAL-IN-CHARGE:	JD	PROJECT MANAGER:	RJF



Example Sample Grid - Composite Sample Locations (1"=5')



Legend	
	100' Buffer Zone
	Tree Line
	Delineated Wetland Boundary
	Property Line
	Proposed Excavation Boundary (Approximate)
	Area of Stunted Growth
	Perimeter Sample Locations

Environmental Resources Management 309 Bayston Street Boston, MA 02116 (617) 267-8377				Designed by: Drawn by: JE Checked by: RBL Reviewed by: RJF Submitted by:		Former Raytheon Facility 430 Boston Past Road Wayland, MA Verification Sampling Grid									
Revisions <table border="1"> <thead> <tr> <th>Symbol</th> <th>Description</th> <th>Date</th> <th>Approved</th> </tr> </thead> <tbody> <tr> <td></td> <td>Grid (0)</td> <td></td> <td></td> </tr> </tbody> </table>				Symbol	Description	Date	Approved		Grid (0)			Scale: 1"=25' Date: 06/26/03		Drawing No. _____ Figure No. 2 Contract No. 1922.03	
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