

Crustal structural relations on Port au Port Peninsula, western Newfoundland: insights from seismic reflection data, and implications for allochthoneity in the Humber Zone

G.S. Stockmal

Geological Survey of Canada, Bedford Institute of Oceanography, P.O. Box 1006, Dartmouth, Nova Scotia B2Y 4A2, Canada

and

J.W.F. Waldron

Department of Geology, St. Mary's University, Halifax, Nova Scotia B3H 3C3, Canada

Structures associated with the Acadian deformation front in western Newfoundland are exposed on Port au Port Peninsula and are imaged on petroleum industry marine multichannel seismic reflection lines located 25 to 75 km NE of the peninsula. Field and seismic data support interpretation of the deformation front as a structural "triangle zone", characterized by an upper thrust detachment with a sense of vergence (SE) opposite to that

of the orogen as a whole (NW). This upper detachment, in the Port au Port area, appears to preferentially lie at the base of the Late Ordovician (post-Taconian) Long Point Group, structurally separating the Long Point-Clam Bank succession from the underlying Humber Arm Allochthon. The Lourdes Limestone of the Long Point Group, seen on the seismic data to overlie the foreland succession in the offshore (conformably?), contain wide (up to 3

m) near bedding-parallel deformation zones dipping moderately NW with clear duplication locally. The critical basal contact with the Humber Arm Allochthon was dug out revealing a sharp uneven surface with strong down-dip slickenside striations. The Humber Arm rocks were highly sheared green plastic mudstones

with a mm-scale anastomosing "scaly fabric". As strongly suggested by the seismic data, we interpret this contact as a thrust, not an unconformity as long believed. These relationships imply substantial Acadian transport of "autochthonous" platform carbonates and overlying rock in western Newfoundland.