! ! "#\$!%&' (!)!*+,,!-(-%! !

. /0!12+34+!5/+6789!

5:

+T,7!F9!f+g!K,7+/,H!+4+,Hh7!+4!3EEI 7!9/!6/9T,7?!9/+,,H!+48:9/!34!c/3F340;!fTg!6/7E74F!/7,7L+4F! 34C9/?+F394!+48!387+E!34!+4!9/Q+43h78!C+E2394!9/+,,H!+48:9/!34!c/3F34Q;!fKg!87L7,96!+48!7d6/7EE! e+EF,H;!C7!+,,!4778!F9!F748!K+/7CI,,H!F9!P77634Q!,347E!9C!K9??I43K+F394!96740!Z!C3,,IC9/P!F9!K2+,,74Q7!H9I! +E!?IK2!+E!Z!K+4!C3F29IF!9L7/C27,?34Q!H9I0!59!EI669/F!H9I/!6/9Q/7EE!F2/9IQ29IF!F27!K9I/E7;!Z!6,+4!F9! K27KP!34!F2/9IQ29IF!F27!E7?7EF7/;!49F!94,H!F9!?+P7!EI/7!H9II/7!P77634Q!I6!C3F2!F27!/7+834Q!+48!C/3F34Q! TIF!F9!?+P7!EI/7!F2+F!H9I!+/7!8934Q!C7,,0!S48!C274!H9Ip/7!49F;!F9!27,6!H9I!C348!F27!EI669/F!H9I! 47780![+F374K7q!C3F2!947E7,C!+48!C3F2!9F27/Eq!3E!K/3F3K+,!C9/!+!EIKK7EECI,!,7+/434Q!7d67/374K70!

ļ

Z4!+883F394!F9!K9?6,3+4K7!c3F2!o7E23L+!i 43L7/E3FHIE!M987!9C!M9481KF;!34!F23E!K91/E7;!EF1874FE!c3,,!T7!767KF78!F9=!

- ! "#\$%"% ()*+))(",)%-.\$-/.\$';!2+L34Q!/7+8!+48!/7E7+/K278!?+F7/3+,!I 487/!EFI 8H'!7d6,3K3F,H!8/+C!94! F2+F!6/76+/+F394!TH!/7C7//34Q!F9!7L3874K7!C/9?!F7dFE!+48!9F27/!/7E7+/K2!94!F27!F963K!9/!3EEI 7!F9! EF3?I,+F7!+!F29I Q2FCI,;!C7,,V/7+E9478!7dK2+4Q7!9C!387+E0!
- 0, (&(/&\$%/, ' %-/. &(*(-/&\$%\$11\$*&(2\$34!34!+!/+4Q7!9C!K9,,+T9/+F3L7!83EK1 EE394E!f947V94V947;!34!Q/91 6E;!+48! F7+K27/V,78g!c3F2!H91 /!677/E;!T1 3,834Q!94!9F27/EI!387+E!+48!7d6/7EE34Q!F273/!9c4!K,7+/,H!+48! 67/E1 +E3L7,H0!
- 5\$*678. \$\$%9\$/., (, : %, 2(. ", #\$, &\M7,\!62947E;!?9T3,7!87L3K7E;!9/!<u>+6F96E!?+H!49F</u>!IE78!81/34Q!K,+EE0ZC! H9I !2+L7!+4!+KK9??98+F394!,7FF7/;!6,7+E7!?+P7!+!?77F34Q!F9!83EKI EE!81/34Q!F27!C3/EF!C77P!9C!K,+EE0O9I ! C3,.!4778!F9!2+L7!2+/8!K9637E!9C!F27!/7+834Q!?+F7/3+,E!34!K,+EE!+48!F+P7!49F7E!TH!2+480!S,.!K9I /E7! ?+F7/3+,E;!E,387E;!+48!2+4891 FE!C3,.!T7!+L+3,+T,7!94!M+4L+E!+48!K9637E!C3,.!T7!83EF/3T1 F780!
- <\$#",)&. /&\$%",)(' \$. /&\$%3/)). ""#%", ' +*&!F9!742+4K7!H91/!+K+87?3K!7d67/374K7!+48!F2+F!9C!H91/! K9,,7+Q17E0!Z4!6+/F3K1,+/;!H91!+/7!+EP78!F9!K94F/3T1F7!F9!F27!,7+/434Q!74L3/94?74F!TH!T734Q!6/9?6F!+48! K91/F791E:!49F!7+F34Q!81/34Q!K,+EE;!+48!49F!C+,P34Q!34!+48!91F!9/!F+,P34Q!34+66/96/3+F7,H!9/!91F!9C!F1/40!!
- =\$) \$*&%' +. %(#\$%': \$&6\$.0!SF!+!/7E7+/K2!I 43L7/E3FH!E1 K2!+E!oi ;!34EF/1 KF9/E!2+L7!? +4H!/7E694E3T3,3F37E! +48!87? +48E!94!F273/!F3? 7!34!+883F394!F9!F7+K234Q;!+48!F27H!+/7!49F!+L+3,+T,7!F9!EF1 874FE!+F!+,,!F3? 7E0! D7/7!+/7!E9? 7!? 7F298E!9C!/7E67KF34Q!H91 /!34EF/1 KF9/pE!F3? 7!f+48!H91 /Eg!91 FE387!9C!K,+EE=!
 - B/34Q!C9K1 E78!] I 7EF394E!C274!H9I !+FF748!9CC3K7!29I /E!+48!T7!EI /7!F9!K94F+KF!H9I /!34EF/I KF9/!34!+!
 F3?7,H!C+E2394!3C!H9I !C3,,!49F!T7!+T,7!F9!P776!+!EK278I ,78!+66934F?74F0!
 - O274!C/3F34Q!+4!7?+3,;!T7!E1 KK34KF!+48!6/7E74F!H91 /!] I 7EF394E!+E!K,7+/,H!+E!69EE3T,7^!+,C+HE!I E7!+4!
 +66/96/3+F7!F947;!E3Q4!H91 /!4+?7;!+48!6/99C/7+8!H91 /!7?+3,E0!
- SL938!7?+3,340!H91 /!34EF/1 KF9/!+T91 F!? +FF7/E!F2+F!K+4!T7!+88/7EE78!34!67/E94!T709/7!9/!+07/!K,+EE0!
 !

I

L

SK+87? 3K!83E2947EFH!3E!I 4+KK76F+T,7!+48!c3,,!49F!T7!F9,7/+F78!+F!07E23L+!I 43L7/E3FH0M27+F34Q;!C9/Q7/H;! 83E2947EF!K9481 KF;!+48!6,+03+/3E?!7/987!0i IE!781 K+F394+,;!/7E7+/K2;!+48IE9K3+,!EF+48+/8E0!527H!87L+,17! F27!,7+/434Q!7d67/374K7!+48!3FE!,703F3? +KH!49F!94,H!C9/!F27!67/67F/+F9/EITI F!C9/!F27!74F3/7!K9?? I 43FH0ZF!3E! 3? 67/+F3L7!F2+F!H91 IC+?3,3+/3h7!H91 /E7,C!C3F2!0i IE!<u>SK+87?3K!Z4F70/3FH!1F+F7?74F</u>!+,94Q!C3F2!F23E!EH,,+TI E0! ZF!3E!7EE74F3+,!F2+F!+,,!?7?T7/E!9C!91 /!+K+87?3K!K9??I 43FH!EI TEK/3T7!F9!F27!387+,!9C!+K+87?3K!34F70/3FH! +48!+KK76F!3483L38I +,!/7E694E3T3,3FH!C9/!F273/!C9/P0!134K7!6,+03+/3E?!3E!+!E7/39I E!F/+4E0/7EE394!9C!7F23KE;! +4H!34EF+4K7E!9C!6,+03+/3E?!C3,,!T7!61 /EI 78!F2/9I 02!F27!+66/96/3+F7!83EK36,34+/H!K2+447,E'1+,!34EF+4K7E!9C! 6,+03+/3E?!+/7!/769/F78!F9!F27!.7+4!+48!?+H!T7K9?7!+!6+/F!9C!H9I /!67/?+474F!C3,70! [74+,F37E!C9/! 6,+03+/3E?!+/407!C/9?!/7K73L340!+!C+3,340!0/+87!94!F27!7EE+H!F9!/7K73L340!+IC+3,340!0/+87!C9/!F27!K9I /E7;!,9EE! 9C!2949/E;!EI E674E394;!9/!7L74!7d61,E394!C/9?!EK299,0!!

[,+03+/3E?!?7+4E!?3E/76/7E74F340!E9?7947!7,E7IE!C9/8E!9/!387+E!F9/!F27!C9/8E!9/!387+E!6/98I K78!TH!SW! ,3P7!\$[5g!+E!H91/!9C4V![,+03+/3E?!K+4!T7!+4!+KF!9C!87,3T7/+F7!C/+18:!E1K2!+E!F1/4340!34!C9/P!C29,,H!9/! 6+/F3+,,H!K1 FV+48V6+EF78!C/9?!F27!34F7/47F!+E!H91/!9C4;!?3E1 E7!9C!+/F3C3K3+,!34F7,,3074K7!FSWg!F7K249,90H! ,3P7!M2+F\$[5!F87F+3,E!T7,9Cg;!9/!3F!?+H!T7!+4!34+8L7/F74F!7//9/;!E1K2!+E!C9/07FF340!F9!K3F7!+IE91/K7!C29E7! 387+E!H91!6+/+62/+E78!9/!?7+4F!F9!]19F7V!S,F29102!+,,!34EF+4K7E!?+H!49F!/7K73L7!F27!E+?7!674+,FH;!F27E7! +/7!+,,!C9/?E!9C!6,+03+/3E?;!+48!H91!+/7!7d67KF78!F9!P49C!+48!F+P7!/7E694E3T3,3FH!C9/!H91/!C/3F340!+48!1E7! 9C!91FE387!E91/K7E0!!

523E!K9I /E7!C9,,9CE!07E23L+!i 43L7/E3FHIE!<u>SK+87?3K!Z4F7Q/3FH![9,3KH</u>!94!+/F3C3K3+,!34F7,,3Q74K7!fSZg0!527!IE7! 9C!*generative* +/F3C3K3+,!34F7,,3Q74K7!9/!+4H!6,+FC9/?!C3F2!Q747/+F3L7!+/F3C3K3+,!34F7,,3Q74K7!K+6+T3,3F37E!3E!

İ.

6/923T3F78l34lF23ElK9I /E70!527l1 E7!9C!*assistive*!+/F3C3K3+,!34F7,,3074K7q 34K,1 834Q!Q/+??+/!K27KP7/E;!E67,,! K27KP7/E;!+48!8303F+,!F27E+1 /1 E7Eq 3E!+,,9C780 [/7V+66/9L78!+EE3EF3L7!SZ!6,+FC9/?E!34K,1 87!E67,,!K27KP7/E! +48!Q/+??+/!K27KP7/E!34!K3K/9E9CF!O9/8!+48!\$99Q,7!.9K1?74FE;!\$/+??+/,H;!+48!D7??34QC+H0!S4H! 6,+FC9/?!49F!,3EF78!+T9L7!3E!49F!+66/9L78!C9/!1 E70!ZC!H91!+/7!L4E1/7!C27F27/!+!6,+FC9/?!9/!F7K249,9QH!3E!

O77P!%=!51 7E8+H;!&: YN!\$!521 /E8+H;!&: Y&!	U+,7302;!D7/T7/F;!1674E7/! M9??946,+K7!1IT?3EE394!tY!
077P!>=!51 7E8+H;!&: -%!\$!521 /E8+H;!&: - !</td <td>12+P7E67+/7;!u94E94;!. 9447!</td>	12+P7E67+/7;!u94E94;!. 9447!

O77P!<=!51 7E8+H;!Y(:Y!!